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THE STANFORD EXPEDITION TO BRAZIL, 1911

J. C. BRANNER, DIRECTOR

DERMAPTERA AND ORTHOPTERA I

BY JAMES A. G. REHN

The very interesting and diversified collection of Dermaptera and Orthoptera made by the Stanford Expedition to Brazil was placed in my hands for study several years ago, but numerous other matters prevented an earlier completion of the report. We are now able to place in print the results of the study of the Dermaptera, the non-saltatorial groups of the Orthoptera and the Acrididae, which contributions we expect to follow, as early as possible, with others on the Tettigoniidae and Gryllidae.

A considerable portion of the material had been collected in liquid preservative, from which it was mounted, and in consequence the colors have been very greatly altered in some individuals, while in others the shrivelling during drying has greatly altered and distorted certain structural features. Due allowance has been made for possible changes in all of the material which shows evidence of having been dried from liquid preservative.

Three well separated regions are represented by the material: the extreme north-eastern portion of Brazil, which previously has been almost unexplored entomologically; the vicinity of Pará, State of Pará, and localities along the line of the Madeira-Mamoré Railroad on the Madeira affluent of the Amazon. A few specimens were also collected at Manaus, on the lower Rio Negro, State of Amazonas. For further data than here given on the position of localities mentioned, see Baker's paper on the mollusca of the Expedition.¹

To make the present work more complete we have added records of a number of species taken at Pará, by C. F. Baker; at Peixe Boi, a short distance east of Pará, taken by H. B. Merrill, and at Igarapé de Candelaria, Rio Madeira, by E. A. Smith; the material on which all of the same are based being contained in

¹ Proc. Acad. Nat. Sci. Phila., 1913, pp. 623 to 624, (1914).

the collections of the Academy of Natural Sciences of Philadelphia. The first set and greater portion of the Stanford material has been placed in the collections of the same Academy, while a smaller set will be retained by Stanford University.

In the present paper are treated one hundred and twenty-five species, belonging to eighty-five genera, of which seventeen species and two genera are described as new. The total number of specimens examined in this connection is three hundred and seventy-five.

DERMAPTERA

PYGIDICRANIDAE

Pygidicrana V-nigrum (Serville)

1831. *Pygidicrana V-nigrum* Serville, Ann. Sci. Nat. xxii, p. 31. [Brazil.]

Natal, Rio Grande do Norte. (Mann.) One imperfect immature specimen.

This individual has lost the apex of its abdomen, so the sex is uncertain.

Pyragropsis² brunnea (Burr)

1909. *Pyragra brunnea* Burr, Ann. and Mag. Nat. Hist., (8), iii, p. 254. [Fon-teboa, Brazil (nec Peru); Iguapo, Peru.]

Pará, Pará. (Mann.) Two females.

Porto Velho, Rio Madeira. One immature female.

The immature female has lateral series of small yellowish spots on the dorsal segments of the abdomen, such as are mentioned by Borelli as occurring occasionally in *P. paraguayensis*. The Pará record is the most eastern for the species.

Pyragropsis emarginata new species (Plate XIV, fig. 1.)

Type.—♂; Manaos, Amazonas, Brazil. (Stanford Brazilian Expedition; Mann and Baker.) [Acad. Nat. Sci. Phila., Type no. 5233.]

This very striking species is clearly a member of the genus *Pyragropsis*³ agreeing with the original description of the genus in every important character but one, namely, the emargination of the margin of the penultimate ventral abdominal segment.

² For remarks on the genus see Burr, Ann. K.-K. Naturhist. Hofmus. Wien, xxvi, p. 334, (1912).

³ Boll. Mus. Zool. Anat. Comp. Univ. Torino, xxiii, no. 594, p. 2, (1908).

This, however, Burr has stated cannot be considered of generic value, and his *Propyragra*, based on this feature, is now placed by him in the synonymy under *Pyragropsis*.⁴

The nearest ally of the new form is *P. thoracica* Serville, which, according to Burr, agrees in the emarginate penultimate abdominal segment of the male, but from which *emarginata* differs in the obliquely instead of squarely truncate distal margin of the tegmina and in a number of features of the color pattern, as the bi-colored exposed portion of the wings, the spotted tegmina, the absence of rufous from the pronotum and more infusate limbs. When compared with the very ample and satisfactory description of *P. tristani* Borelli, which is also very close to the new form, the latter is found to differ in having twenty-two antennal segments, in the obliquely truncate instead of rounded distal margin of the tegmina, in the caudal margin of the disto-dorsal abdominal segment being truncate instead of concave, and in certain color differences, as the absence of longitudinal tegminal bars and in the femora having the same base color as the tibiae.

Size rather small; form weakly depressed; surface entirely dull except that of the disto-dorsal abdominal segment and of the forceps which are moderately polished, dorsal surface of unpolished abdominal segments probably in an unrubbed condition completely covered with silvery scales, well marked traces of which remain, long and short hairs disposed over the surface as in *P. tristani*. Head triangular, caudal angles roundly obtuse, occipital margin straight, surface of occiput gently convex dorsad, indications of several short irregular sulci present, usual transverse sulcus not indicated; eyes but little prominent; antennae composed of twenty-two segments, proportioned as in *P. tristani*. Pronotum very slightly broader than long, general form as in *tristani* but caudo-lateral angles more rounded; cephalic two-thirds of surface subconvex, remainder flattened and moderately elevated toward the lateral and caudal margins; medio-longitudinal sulcus delicate but continuous. Tegmina one and one-half times as long as the pronotal disk, lateral outline when viewed from the dorsum gently arcuate, the tegmen appreciably narrower distad than mesad; caudal margin obliquely truncate. Exposed portion of the wings not more than a fourth as long as the tegmina, apices squarely truncate, lateral outline arcuate. Scutellum exposed between the tegminal bases, subtrigonal. Abdomen moderately broad, subfusiform, all of the dorsal segments more or less produced caudate along the lateral line, the sixth, seventh and eighth segments with carina similar to *P. tristani*, structure of same region of ninth segment similar to *tristani*; disto-dorsal abdominal segment with the caudal margin truncate, sculpture as in *tristani*; forceps as in *tristani* but faintly more slender; penultimate ventral segment with the lateral margins converging

⁴ Burr, Ann. and Mag. Nat. Hist., (8), iii, pp. 333 to 334.

caudad in a sigmoid fashion, the distal extremity deeply and rather broadly U-emarginate, the lateral angles well rounded; ultimate ventral segment covered. Limbs moderately robust; tarsi with distinct arolia between the claws.

General color dull fuscous-black (Ridgway), on the abdomen burnt umber, all pale maculations cream color. Head with distal margin of clypeus pale; antennae with joints 16 to 18 or 15 to 17 pale. Pronotum with lateral "wings" and all except median portion of caudal third pale. Tegmina with a pale proximal spot placed nearer the sutural than the costal margin; exposed portion of wings with external half pale. Limbs with the disto-dorsal portion of the femora, adjacent portion of the tibiae, distal extremity of tibiae and all (caudal) or a portion (cephalic and median) of the metatarsi pale. Abdomen with the ventral surface paling to mahogany red; forceps becoming mahogany red distad, the pilosity of internal face cream color.

Length of body (exclusive of forceps), 9.5 mm.; length of pronotum, 1.9; length of tegmen, 3; length of left branch of forceps, 1.5.

The type is unique.

LABIDURIDAE

Anisolabis annulipes (H. Lucas)

1847. *Forficelisa annulipes* Lucas, Bull. Soc. Entom. France, IIe ser., v, p. LXXXIV. ["Jardin de Plantes, Paris"; probably introduced.]

Independencia, Parahyba. (Mann and Heath.) Three females.

Euborellia janeirensis (Dohrn)

1864. *F[orcinella] janeirensis* Dohrn, Entom. Zeit. Stettin, xxv, p. 285. [Rio de Janeiro, Brazil.]

Ceará Mirim, Rio Grande do Norte. (Mann.) Two males.
Independencia, Parahyba. (Mann and Heath.) Two males, four females.

The pale antennal annulus is present in all the specimens which have complete antennae, its width generally covering two segments, but its position varying from segments seven to nine to fifteen to sixteen, the individual having the seven to nine extreme on one antenna having the annulus on segments twelve to thirteen on the other antenna.

Psalis scudderi Bormans?

1900. *Ps[alis] scudderi* Bormans, Ann. Mus. Civ. Stor. Nat. Genova, (2), xx, p. 449. [Puerto 14 de Mayo, Upper Paraguay (now in Bolivian Chaco); Olivenza, Amazon River (Brazil).]

Pará, Pará. (C. F. Baker.) Two males.

These specimens are assigned to this species with some doubt, as in this extremely complex genus with several polymorphic

species, it is difficult to judge what are and what are not criteria of specific value. Both of our specimens are without apparent wing scales, these being present in the type of *scudderi*, but we know other species of the genus vary in this respect. The tegmina are shorter in proportion than Bormans describes, but this also we know is intra-specifically variable in the genus. The antennae have the distal pale annulus as described but the proximal joints are not pale. When compared with the closely related *P. burri* Borelli⁵, from Paraguay, our material differs in the more longitudinal pronotum, in the tegmina having the distal margin slightly oblique truncate toward the disto-costal angle instead of the disto-sutural angle, in the form of the anal segment and forceps and in the color of the limbs; agreeing, however, in the absence of wing scales and in the form of the lateral portion of the abdominal segments. As *scudderi* was based on the female sex and *burri* on the male, the last mentioned difference is probably sexual.

***Psalis* species**

Porto Velho, Rio Madeira. (Mann and Baker.) One female.

***Labidura riparia* (Pallas)**

1773. *Forficula riparia* Pallas, Reise Russ. Reichs, pt. ii, p. 727. [Shores of Irtysh River, western Siberia.]

Pará, Pará. (Mann.) One male.

Abuna, Bolivia. (Mann and Baker.) One male.

We have not attempted to allocate these specimens in the present species complex, as that seems unwarranted in the present state of our knowledge. Both individuals have the caudal margin of the anal segment bidentate, the teeth larger and closer together in the Pará specimen than in the Abuna one.

LABIIDAE

***Spongovostox alter* (Burr)**

1912. *Spongovostox alter* Burr, Ann. K. -K. Naturhist. Hofmus. Wien, xxvi, p. 336, fig. 13. [Mapiri, Bolivia (type locality); Minas Geraes, Brazil; Bugaba, Panama.]

Porto Velho, Rio Madeira. (Mann and Baker.) One male.

Abuna, Bolivia. (Mann and Baker.) One male.

⁵ Boll. Mus. Zool. Anat. Comp. Torino, xx, no. 516, p. 2, fig., (1905).

The type locality (Mapiri [or Mapari]) is on the upper Beni, a tributary of the Mamoré-Madeira drainage, situated 68° W, 14° 40' S. The specimens recorded above are perfectly typical.

Spongovostox pygmaeus (Dohrn)

1864. *P[salidophora] pygmaea* Dohrn, Ent. Zeit. Stettin, xxv, p. 421. [Rio de Janeiro, Brazil.]

Madeira-Mamoré R. R. Company Camp 41, Rio Madeira. (Mann and Baker.) One male.

This specimen differs in several respects from the original description of this variable species, to which, however, it clearly belongs. The forceps have no distinct teeth on the internal margin, but are denticulate for the greater portion of their length, while the pale humeral maculation on the tegmina does not reach the distal margin of the same, the pale area on the exposed portion of the wings not being continuous with that on the tegmina. The character of the forceps is as found in the synonymous (according to Burr) *Labia tricolor* Kirby from Santarem, Brazil, but the pygidium is as figured by Burr for the species.⁶

The previously known records in addition to those given above are: Brazil (Burr), Peru (Burr).

We have encountered some difficulty in using the notes and figures made by Burr for the species of this genus.⁷ Two forms as there treated do not agree with the original descriptions of the species: *ghilianii* Dohrn being described originally as possessing a male pygidium "longe productum, postice rotundatum," while Burr informs us the same is "breit, mehr oder weniger abgerundet, mit einem mikroskopischen Fortsatz an dem Ende"; *confusus* Borelli was originally figured as having the male pygidium nearly a third as long as the forceps, while Burr illustrates this feature as not a tenth the length of the same; the forceps of *confusus*, which were originally described and figured as being straight for two-thirds of their length with their internal margin armed with a tuberculariform dilation, are figured by Burr as sinuate proximad with several denticulations of quite different character on the internal margin. It appears to us that Dohrn in describing *ghilianii* probably utilized the Pará specimen collected by Ghiliani more than the material from Cayenne and Venezuela, that from the latter locality, in the Vienna Museum,

⁶ Ann. K.-K. Naturhist. Hofmus. Wien, xxvi, p. 335, fig. 7, (1912).

⁷ Ibid., pp. 335 to 337, figs. 7 to 16, (1912).

having been examined by Burr and designated as "type." If the Venezuelan specimen shows the different type of pygidium described and figured by Burr it certainly does not accord with the original description. In the case of *confusus* it is evident to us that the Colombian material examined by Burr is not specifically identical with the typical Paraguayan specimens of Borelli.

***Labia curvicauda* (Motschulsky)**

1863. *Forficelisa curvicauda* Motschulsky, Bull. Soc. Nat. Moscou, xxxvi, p. 2, pl. II, fig. 1. [Nura-Ellia Mountains, Ceylon.]

Pará, Pará. (C. F. Baker.) One male, one female.

These specimens fully agree with individuals from Long Key, Florida. Aside from the present record, the only one we can find of the occurrence of this circumtropical species on the mainland of South America is that of the synonymous *Labia glabricula* Kirby, from Santarem (Kirby) and São Paulo (Burr), Brazil. It seems desirable to call attention to the fact that the key for the genera of Labiinae given by Burr⁸ would run this species to *Chaetospania* or *Sphingolabis*, the head in this species being sub-sinuate caudad when compared with *L. minor*, the genotype, which is in the alternate category. Apparently this feature is not of generic value in the present instance, as *curvicauda* is congeneric with *minor*.

***Sparatta semirufa* (Kirby)**

1896. *Sparatta semirufa* Kirby, Journ. Linn. Soc. London, Zool., xxv, p. 528, pl. XX, figs. 4, 4a. [Igaourasu, near Pernambuco, Brazil.]

Pará, Pará. (Mann.) One female.

This specimen is referred tentatively to the present species, the exact relationship of which to certain of the other forms of the genus is not at present clearly understood. However, our individual fully agrees with Kirby's description except that there are no blackish markings on the head or pronotum.

Borelli has reported this species from Tacuru Pucu, Paraguay and San Pedro, Misiones, Argentina.

***Prosparratta incerta* (Borelli)**

1905. *Sparatta incerta* Borelli, Boll. Mus. Zool. Anat. Comp. Torino, xx, no. 516, p. 11, figs. [Puerto Bertoni, Paraguay.]

Porto Velho, Madeira River. (Mann and Baker.) Two males, three females.

⁸ Genera Insect., Dermapt., p. 53, (1911).

Madeira River. (Mann and Baker.) One female.

These specimens are somewhat smaller than the original measurements, but otherwise they are in complete accord. The species has also been recorded from San Bernardino, Paraguay; Iatahy, Goyaz, Brazil (Burr), as well as several localities in Costa Rica and Vera Cruz, Mexico (Borelli).

FORFICULIDAE

Doru lineare (Eschscholtz)

1822. *Forficula linearis* Eschscholtz, Entomogr., p. 81. [Santa Catharina, Brazil.]

Independencia, Parahyba. (Mann and Heath.) One female.

Madeira-Mamoré R. R. Camp 43, Rio Madeira. (Mann and Baker.) One male.

The last mentioned individual belongs to the form (*californica*) without the usual tooth on the internal margin of the forceps.

ORTHOPTERA

BLATTIDAE

ECTOBIINAE

Anaplecta grandipennis (Saussure and Zehntner)

1893. *Anaplecta grandipennis* Saussure and Zehntner, Biol. Cent.-Amer., Orth., i, p. 25, tab. iv, fig. 5. [Pernambuco, Brazil.]

Manaos, Amazonas. (Mann and Baker.) One female.

This specimen fully agrees with the description of the type and considerably extends the range of the species. When compared with the allied *A. replicata* the shape of the costal margin of the tegmina is seen to differ, in addition to the other differential character cited by the describers.

Anaplecta analisignata new species (Plate XIV, figs. 2 and 3.)

Type.—♀; Manaos, Amazonas, Brazil. (Mann and Baker.) [Acad. Nat. Sci. Phila., Type no. 5235.]

Allied to *A. nahua* Saussure, *pallicornis* (Walker) and *bivittata* Brunner, differing from the first in the much more extensive appendicular field of the wing, the more numerous costal veins of the wing, the broader medio-discoidal area of the same and the rather different coloration. From *pallicornis* it differs in the bilineate pronotum and details of the tegminal coloration, while from *bivittata* it can be separated by the tegminal infuscation not being squarely cut mesad.

Size small; form elliptical. Head with the greatest depth slightly greater than the greatest width across the eyes; occipital outline strongly arcuate, the width between the eyes one and one-third times the depth of one of the eyes; face with the width between the antennal scrobes about three-fifths that between the eyes; eyes hardly projecting, in basal outline strongly reniform; antennae at least a third again as long as the head, pronotum and closed tegmina together. Pronotum trapezoid in general form, the cephalic margin narrow, subtruncate, cephalo-lateral angles broadly rounded, lateral margins moderately arcuate, caudo-lateral angles rotundato-rectangulate, caudal margin subtruncate; lateral sections rather strongly deflexed, disk subdeplanate, a subarcuate impressed area bounding the dark bars laterad. Tegmina about three times as long as the pronotum, lanceolate, the greatest width (mesad) almost equal to the greatest length of the pronotum; costal margin moderately arcuate, sutural margin straight, weakly arcuate distad, apex narrowly rounded; marginal field rather narrow, translucent, reaching almost to the middle of the tegmen, discoidal and anal fields opaque; mediastine vein faintly bent mesad; costal veins ten in number, very faintly clavate, oblique; discoidal vein straight, discoidal rami three in number (costal one also bifurcate), longitudinal; ulnar vein simple; anal vein reaching sutural margin slightly proximad of proximal third; anal field acute pyriform. Wing with the costal margin sinuate; costal veins eight in number, distinctly clavate distad, oblique; humeral vein short, connecting with the four proximal costal veins, irregular; discoidal vein reaching the proximo-costal angle of the appendicular field; medio-discoidal area over three times as broad as the medio-ulnar area, with three transverse nervures which form two quadrate areas mesad; ulnar vein bifurcate at distal third, the cephalic ramus meeting the distal margin of the discoidal field near the discoidal vein; appendicular field ample, in length about one-half that of the remaining section of the wing, semielliptical, the greatest proximal width somewhat greater than the length of the field. Abdomen of type missing. Cephalic femora with the ventro-cephalic margin bearing a pair of spines at the proximal third and a distal pair, the former subequal, the latter very unequal in length (distal longer), intervening section of the margin closely haired. Median femora with three long spines on proximal half of the ventro-cephalic margin, a single one distad, a long genicular spine present, ventro-caudal margin with spaced spiniform bristles. Caudal femora with three spines on the ventro-cephalic margin, one being distal, genicular spine very long, ventro-caudal margin with spaced spiniform bristles; caudal tarsi three-fourths the length of the caudal tibiae, metatarsus but slightly longer than the remaining tarsal joints, a minute arolium present.

General color light buff, becoming warm buff on the median section of the pronotum, a pair of gently diverging bars on the pronotum and the greater portion of the tegmina prout's brown, clearer and more translucent and weakening in intensity distad on the tegmina. Head entirely prout's brown with the buccal region whitish, the occipital region lighter than the face with three spots of the general color transversely disposed; antennae prout's brown, weaker distad, segments narrowly annulate distad with the general color. Pronotum with the lateral sections subhyaline, the dark bars with their external border bisinuate, the enclosed median pale area narrowly flask-shaped,

caudal and lateral margins very narrowly edged with whitish. Tegmina with the marginal field subhyaline, an oblique bar of the general color follows the anal vein for the distal two-thirds of its length, does not sever the dark area at the humeral trunk but passes distad along the sutural margin; the dark discoidal area weakens distad; veins of the infusate area darker than the general tone. Wings but faintly tinted, appendicular field appreciably tinted with buckthorn brown. Limbs clay color, infusate at base of tibial spines.

Length of pronotum, 1.7 mm.; greatest width (caudad) of pronotum, 1.6; length of tegmen, 4.8; greatest width of tegmen, 2.

While the unique type of this beautiful species lacks the abdomen, its characters are so decided we feel no hesitation in describing it.

PSEUDOMOPINAE

Pseudomops inclusa Walker

1868. *Pseudomops inclusa* Walker, Catal. Blatt. Brit. Mus., p. 212. [Brazil.]

Independencia, Parahyba. (Mann and Heath.) One specimen, sex uncertain as abdomen is missing.

This individual fully agrees with Walker's description except that the lateral portions of the black figure on the pronotum are not connected caudad. Shelford⁹ states that in some specimens there is variation in the depth of the whole marking, but in our individual the lateral sections are black while caudad there is only a transverse arcuate cloud in the position of the usual decided transverse marking in *oblongata*, from which, however, the present insect differs in a number of color characters. The description of Saussure's *amoena* from Pernambuco, which is considered synonymous by Shelford, does not satisfactorily agree with the specimen in hand.

Pseudomops annulicornis (Burmeister)

1838. *Th[ysrocera] annulicornis* Burmeister, Handb. der Entom., ii, abth. ii, pt. 1, p. 500. [Bahia, Brazil.]

Pará, Pará. (C. F. Baker.) One male, two females.

Porto Velho, Rio Madeira. (Mann and Baker.) Two males.

The range of the species is greatly extended inland by the last record.

Pseudomops angusta Walker

1868. *Pseudomops angusta* Walker, Catal. Blatt. Brit. Mus., p. 81. [Santarem, Brazil.]

Pará, Pará. (C. F. Baker.) One female.

⁹ Trans. Entom. Soc. London, 1906, p. 253, (1906).

This specimen differs from the original description of the species in having the palpi entirely black, the femora blackish dorsad and the cerci almost entirely black. Otherwise the present individual is completely in accord with Walker's description.

Ischnoptera amazonica new species (Plate XIV, figs. 4, 5, 6, 7 and 8.)

This species is related to *I. rubiginosa* Walker, known from Santarem, Brazil and British Guiana. From *rubiginosa* the present species differs in the somewhat larger size, more diffuse and less contrasted color pattern, proportionately more elongate tegmina and wings, narrower interspace between the eyes, less transverse elliptical pronotum and very different male genitalia.

Apparently there is some relationship to *I. taczanowskii* Bolivar, from the western coast region of Peru, but a number of features of differences can be noted in the description.

Type.—♂; Igarapé-Assu, State of Pará, Brazil. (H. S. Parish.) [Acad. Nat. Sci. Phila., Type no. 5318.]

Size medium: form elongate elliptical, depressed. Head projecting but little cephalad of the pronotum: interspace between the eyes narrow, no greater than that between the ocelli and twice as wide as the proximal antennal joint: ocelli reniform: eyes large, their greatest depth cephalad distinctly less than the interspace between them: palpi with third and fifth joint subequal in length, the former relatively slender, subcylindrical; fourth joint faintly shorter than the third joint, moderately conical; fifth joint relatively deep proximad, tapering, subcompressed: antennae exceeding the body in length. Pronotum broad elliptical, moderately transverse, the greatest length contained one and one-third times in the greatest width of the same, greatest width situated slightly caudad of the middle: cephalic margin arcuato-truncate; latero-cephalic angles very slight and broadly rounded obtuse; lateral margins strongly arcuate; latero-caudal angles obtusely rounded; caudal margin gently obtuse arcuate: disk with paired distinct obliquely diverging impressions: lateral portions of pronotum moderately deflected. Tegmina surpassing the apex of the abdomen by nearly the length of the pronotum, elongate, margins in large part subparallel, the greatest width at distal third: costal margin moderately arcuate in proximal third, thence straight except for a short distal arcuation to the apex, which is faintly nearer the costal than the sutural margin; sutural margin straight except in distal third, where it is moderately arcuate to the apex: marginal field relatively short and narrow; scapular field moderately broad, subequal; anal field very elongate pyriform, reaching to two-fifths the entire length of the sutural margin from the base: costal veins eighteen to twenty in number, occasionally (particularly distad) bifurcate; median vein bifurcate slightly proximad of the middle; ulnar vein with four rami, all diverging mesad on the sutural side, all reaching the apical margin, except a bifurcation of the proximal one, which reaches the sutural margin slightly short of the apical margin. Wings reaching to (or faintly

surpassing) the apices of the tegmina, greatest width contained faintly more than one and one-half times in the greatest length: costal margin subtruncate in distal half, apex well rounded: anterior field quite broad; intercalated triangle small, elongate: discoidal vein straight, except for a slight arcuation distad; costal veins fourteen in number, occasionally these are bifurcate, non-clavate; median vein sinuate; medio-discoidal area slightly wider than the medio-ulnar area, divided into a great number of rectangulate, generally transversely oblong, areas by distinct transverse veins; medio-ulnar area divided into rectangular, generally quadrate, areas, less numerous than those of the medio-discoidal area and with the cross-veins in large part incomplete cephalad; ulnar vein with two complete rami reaching the apical margin and five incomplete rami toward the dividing vein; axillary vein biramose mesad. Sixth dorsal abdominal segment with its margin broadly V-emarginate mesad; seventh dorsal abdominal segment depressed meso-cephalad under the emargination of the preceding segment, moderately vaulted and broadly U-emarginate meso-caudad; eighth dorsal abdominal segment very short, bearing mesad a rounded glandular area; ninth dorsal abdominal segment broadly arcuato-emarginate. Supra-anal plate transverse, margin weakly and rather broadly sinuate laterad, broadly arcuate and moderately produced mesad, margin strongly hirsute; when seen from the caudal extremity the ventral surface of the plate is seen to have on the dextral side an elongate peg-like process, which is directed ventro-mesad within the subgenital plate: cerci depressed, subfusiform, acute distad, hirsute, particularly ventrad: subgenital plate moderately unsymmetrical, styles median, small, slender, simple, subequal in length and in approximately their usual position. Cephalic femora with the ventro-cephalic margin bearing four large median and proximal spines, distad of which is a series of short, fine, regularly disposed and subequal spinules, three apical spines on the same margin large. Median and caudal femora with the ventral margins armed with regularly placed spines: no dorsal genicular spines on the cephalic femora, distinct ones on the median and caudal femora: caudal tarsi with the metatarsus faintly longer than the remaining tarsal joints; arolia small.

Allotype.—♀; Same data as type.

The features here given are those of difference from the description of the male type given above. Interspace between the eyes broader than in the male sex, but retaining its relative proportion to that between the ocelli; eyes with their greatest depth but little greater than the interocular space. Abdomen with no scent-gland opening on dorsal surface. Supra-anal plate moderately transverse, sinuate laterad, broadly V-emarginate mesad and the margin rounded laterad of the same: subgenital plate broad, the margin rounded.

The differences between the recessive and intensive types of coloration is very decided, although the pattern changes but little and the depth of the tone is almost entirely responsible for the apparent diversity. General color cinnamon-buff to clay color, the head, disk of the pronotum and the vicinity of the proximal section of the mediastine vein infuscate with warm sepia to blackish. Head dark; mouth-parts, palpi and ocelli warm buff to ochraceous-tawny; antennae prout's brown to fuscous, proximal joint paler; eyes very dark chestnut brown. Pronotum with the dark disk pattern reversed tri-

angular in the recessive specimens, the narrowest point caudad, in the intensive individuals the whole area of the disk is infusate; the caudal margin of the pronotum is much paler in some individuals than in others, while the dark disk is in all but the most intensive individual distinctly divided in two along the median line by a bar of kaiser brown to pale rufous. In the single exception there is, moreover, a weak indication of such a bar. The pale lateral and cephalic sections of the pronotum are more warm buff to pale ochraceous-buff than the general tone. The tegmina have the marginal and greater portions of the scapular fields pale buffy hyaline, the infuscation along the greater portion of the mediastine vein very decided. Wings with the veins largely clay color, these saccardo's umber on most of the anterior field and the region of the costal veins and apex of the anterior field is washed with yellow ocher. Dorsal surface of the abdomen washed along the lateral borders with mummy brown; ventral surface of abdomen ochraceous-tawny to mummy brown, the paler individuals are mummy brown laterad and distad, the darker ones fuscous; dorsal apex of abdomen and cerci of male mummy brown. Limbs ochraceous-buff to pale ochraceous-buff, the spines ferruginous, the coxae marked with prout's brown proximad.

Measurements (in millimeters)

	Length of body	Length of pronotum	Greatest width of pronotum	Length of tegmen	Greatest width of tegmen
♂					
Igarapé-Assu, Brazil, <i>type</i>	11.2	2.9	3.5	11	3.3
Independencia, Parahyba, Brazil, <i>paratype</i>	9.5 ¹⁰	2.6	3.2	11.3	3.3
diunuha to Concha Huaya, Peru, <i>paratype</i>	8 ¹⁰	2.4	3	9.2	3
♀					
Igarapé-Assu, Brazil, <i>allotype</i>	11.2	2.9	3.6	11.4	3.8
Ceará, Ceará, Brazil, <i>paratype</i>	8.9 ¹⁰	2.9	3.4	10.8	3.2

In addition to the type and allotype we have before us the following paratypes of this species:

Pará, Pará, Brazil. (W. M. Mann; C. F. Baker.) Two males.

Independencia, Parahyba, Brazil. (Mann and Heath.) Two males.

Ceará, Ceará, Brazil. (F. Rocha.) One female. [U. S. N. M.]

Piunuha to Concha Huaya, Peru. October 9 to 13, 1913. One male. [A. N. S. P.]

¹⁰ Specimen dried from alcohol. The measurements may, therefore, be unduly small on account of shrivelling.

These specimens show a decided range of depth in the color pattern, almost entirely in a recessive and intensive fashion, while as shown above the size varies considerably. The median vein of the tegmina frequently has one or the other of the forks bifurcate, while the ulnar vein of the same shows appreciable variation in the exact divergence of its branches. The number of incomplete rami of the ulnar vein of the wing varies from as few as five to as many as seven. The supra-anal plate of the male is quite unique in its peculiar ventral unpaired process on the dextral side.

Cariblatta¹¹ **personata** new species (Plate XIV, figs. 9 and 10.)

Apparently nearest to *C. fossicauda* Hebard, from Trinidad.¹² The female supra-anal plate is briefly cleft mesad, not briefly and roundly emarginate as in *C. aediculata* Hebard, from Trinidad,¹³ or with a shallow emargination weakly indicated as in *fossicauda*. Though one of the plain colored species of the genus, the present species differs in having the general coloration a paler, slightly more reddish brown, while the ventral surface of the abdomen is distinctly marked with dark brown. It is the only South American species of the genus which has the female subgenital plate distinctly marked mesad. With males the position of the species and its peculiarities would be easier to indicate, but its distinctness is evident with the female sex alone.

Type.—♀; Ceará Mirim, Rio Grande do Norte, Brazil. (W. W. Mann.) [Acad. Nat. Sci. Phila., Type no. 5236.]

Size as usual in the genus. Maxillary palpi with third joint moderately elongate, fourth joint slightly shorter and tapering proximad, fifth (distal) joint longer than the fourth and subequal in length to the third, inflated; interspace between the eyes very broad, very slightly greater than that between the antennal scrobes and distinctly greater than that between the ocelli. Pronotum of the form usual in the genus, greatest width caudad, the lateral margins obliquely arcuate, caudal margin truncato-arcuate, cephalic margin narrowly rounded; lateral portions moderately declivent. Tegmina lanceolate, somewhat surpassing the apex of the abdomen, apex of tegmina rounded; marginal field reaching to the middle of the costal margin; humeral vein bearing nine complete costal veins proximad of a fork, the costal arm of which bears four additional costal veins; rami of the discoidal vein four in number, sublongitudinal, ulnar vein carried a considerable distance distad along the sutural margin of the tegmina; cross nervures between discoidal rami nu-

¹¹ Vide Hebard, Trans. Amer. Entom. Soc., xlii, p. 147, (1916).

¹² Ibid., pp. 154, 156, 177, pl. xi, figs. 13 to 17, pl. xii, figs. 17 and 18.

¹³ Ibid., pp. 154, 156, 179, pl. xi, figs. 18 and 19, pl. xii, figs. 19 and 20.

merous and weakly indicated, except on the normally covered section of the dextral tegmen, where they are quite distinct; anal field elongate pyriform. Wings reaching to the tegminal apices; costal veins numerous and moderately clavate distad; medio-discal and medio-ulnar areas in general subequal in width; ulnar vein with one large ramus; intercalated triangle distinct, of fair size. Abdomen broad, depressed, distal extremity of the abdomen considerably narrowed; penultimate dorsal segment broadly obtuse-emarginate distad; disto-dorsal abdominal segment arcuate-truncate mesad; supra-anal plate transverse, margin obtuse-angulate with a distinct short, narrow, median fissure, the plate depressed on each side of the median area, which in section is tectate; cerci depressed subfusiform, apices imperfect in type; subgenital plate scoop-shaped, rather more produced and compressed than in related forms, the apex is very narrowly emarginate-truncate. Cephalic femora with ventro-distal margin bearing three median and two distal (apical) long spines, the margin between with a fairly closely placed series of much shorter spines. Caudal tarsi slightly shorter than the caudal tibiae, the metatarsus subequal in length to the remaining tarsal joints; arolia on all tarsi.

General color pale yellow ocher, the veins of the wings and of the normally covered portion of the dextral tegmen dresden brown. Head with occiput and interocular region antimony yellow, crossed by a decided transverse bar of cinnamon-brown; maxillary palpi light buff; eyes mars brown. Pronotum with the disk opaque antimony yellow with five pairs of more or less broken lines of ochraceous-tawny; these lines vary in thickness and intensity, but, aside from the parallel median pair, are arranged in an appreciably concentric pattern. Tegmina with the normally covered portion of the dextral tegmen whitish. Dorsum of abdomen mummy brown with the segments margined laterad with, and the distal segments divided mesad by, light ochraceous-buff; venter of abdomen in ochraceous-buff with a paired intermarginal bar on each side, coming to a point at the cercal bases, and a median bar, which is very broad proximad, tapering mesad and narrow and subequal on the subgenital plate, mummy brown. Cerci mummy brown ventrad and at dorsal base.

Measurements (in millimeters)

	Length of body	Length of pronotum	Greatest width of pronotum	Length of tegmen	Greatest width of tegmen
♀ Ceará Mirim, <i>type</i>	8.8	2.5	3.3	8.5	3
♀ Ceará Mirim, <i>paratype</i>	—	2.6	3.4	8	2.9
♀ Independencia	—	2.4	3.3	7.8	3

In addition to the type we have examined a paratypic female from the type locality and another female (minus the abdomen) from Independencia, Parahyba, Brazil (Mann and Heath). These specimens show no important features of difference from the description of the type. The eyes are seen to vary in color

from nearly blackish to pale buffy, but this is probably due to the immersion in liquid preservative, to which all have been subjected.

***Neoblattella adpersicollis* (Stål)**

1860. *Blatta adpersicollis* Stål, Kongl. Svenska Fregat. Eugenies Resa, Zool., i, p. 308. [Rio de Janeiro, Brazil.]

Pará, Pará. (C. F. Baker.) One male.

Ceará, Ceará. (F. Rocha.) One male. [U. S. N. M.]

***Neoblattella pellucida* (Burmeister)**

1838. *Bl[atta] pellucida* Burmeister, Handb. der Entom., ii, abth. ii, pt. 1, p. 498. [Pará, Brazil.]

Independencia, Parahyba. (Mann and Heath.) Two females.

Pará, Pará. (C. F. Baker.) One male, two females.

We have tentatively identified this species as Burmeister's form, agreeing as it does with his very brief description, but differing in some features from all the other described species. It is a robust insect belonging near *fraterna* Saussure and Zehntner. The species has the interspace between the eyes very wide, equal to one and one-half times the depth of the eye, while the supra-anal plate of the female is deeply divided with margining digitiform processes; the subgenital plate of the female is very slightly produced with the distal margin subsinuato-truncate. The male supra-anal plate is greatly produced and very delicate, with the distal margin broadly rounded; subgenital plate transverse, moderately stout, the styles set in sockets laterad at the bases of the cerci, mesad of which the plate is produced symmetrically in rounded projections, the ventral surfaces of which are strongly convex, and between these projections the margin of the plate is concave.

Four of the seven females seen by us carry oöthecae, their position being vertical with the carina dorsad.

The ventral surface of the abdomen in the female bears a broad medio-longitudinal bar of shining black, which reaches caudad to all but the extreme margin of the subgenital plate. In the male this is represented by a much narrower bar, which is attenuate caudad.

DENDROBLATTA¹⁴ new genus

A member of the Blattellites, but apparently not closely related to any of the previously known genera except *Mareta* Bolivar. The combination of strongly deplanate head, very narrow interspace between the eyes, very wide and deplanate pronotum, the presence of a gland on the seventh dorsal abdominal segment of the male, elongate limbs and peculiar armament of the cephalic femora is diagnostic of the genus.

Generic Characters.—Form deplanate, fully alate in both sexes. Head very strongly deplanate; eyes narrowly separated in both sexes; lateral margins of head ventrad of eyes strongly convergent to the base of the mandibles; maxillary palpi elongate. Pronotum broad, tranverse, with broad lateral margins which are but little deflected. Tegmina with discoidal rami and ulnar vein oblique, former numerous. Wings with intercalated triangle very small, elongate and narrow. Seventh dorsal abdominal segment of male with a decided gland mesad. Supra-anal plate of male strongly transverse; cerci very elongate, deplanate dorsad, ventral surface extremely hirsute and with each segment convex. Limbs extremely elongate; cephalic femora with ventro-cephalic margin armed on distal three-fifths with a close set row of minute chaetiform spines,¹⁵ the series terminated by two elongate spines distad; distinct arolia present.

Genotype.—*Dendroblatta sobrina* new species.

This very striking genus is unique in quite a few morphological features, while its coloration and habits are as distinctive as its structure. The closest affinity of *Dendroblatta* is with *Mareta* Bolivar, from which the narrower eye interspace, the presence of the dorsal gland on the abdomen of the male, the more corneous tegmina and the much more elongate tarsi readily separate the new genus.

¹⁴ This generic name has been given in allusion to the arboreal habits of the species, which will be discussed in detail at a later date.

¹⁵ The proximal two-fifths of the ventro-cephalic margin of the cephalic femora is rarely unarmed, occasionally supplied with one or two small spines and frequently with four or five spines.

Dendroblatta sobrina new species (Plate XIV, figs. 11, 12, 13 and 14.)

Type.—♂; Porto Velho, Rio Madeira, Brazil. (Stanford Expedition; Mann and Baker.) [Acad. Nat. Sci. Phila., Type no. 5245.]

Size medium; form deplanate; surface moderately polished. Head strongly deplanate, in general outline trigonal, the eyes rounded, the lateral margins of the head converging ventrad as far as the bases of the mandibles; occipital outline arcuato-truncate, the least interspace between the eyes less than one-half the greatest thickness of the eyes; eyes in general form strongly arcuate around the insertion of the antennae, greatest thickness cephalad more than twice the thickness ventrad; antennae elongate, setaceous; maxillary palpi of the proportions given in the generic description, the third joint rod-like, the fourth joint tubiform, the fifth joint expanded, the oblique truncation extending two-thirds of the length of the joint. Pronotum transverse subelliptical, the greatest length contained one and two-fifths times in the greatest width, strongly deplanate with the lateral portions gently deflected; cephalic margin of disk arcuato-truncate, latero-cephalic angles obtusely rounded, lateral margins oblique arcuato-truncate cephalad, arcuate caudad, the lateral angles roundly obtuse, caudo-lateral angles broadly rounded, caudal margin truncate; irregular converging oblique impressions indicated on disk. Tegmina surpassing the apex of the abdomen by nearly the greatest width of the pronotum, in general form lanceolate, the greatest width contained about three and one-half times in the greatest length; costal margin appreciably arcuate proximad, nearly straight distad but rounded at the apex; sutural margin straight, distad rounding to the apex, which is median and hardly broad; marginal field quite broad, reaching to the proximal two-fifths of the wing, anal field semiovate-pyriiform, the distal portion of the anal vein strongly arcuate, joining the sutural margin very slightly distad of the proximal third; costal veins numerous, oblique, regular but generally bifurcating distad; rami of the discoidal vein and anal vein oblique, the rami of the discoidal numerous, the majority reaching the sutural margin, the ulnar vein reaching the same margin at about the distal two-thirds, strongly marked intercalated false nervures present in the discoidal field and connected with the main veins and rami by numerous and less apparent transverse nervures, which are subobsolete distad; six to seven not very clearly defined axillary veins present. Wings moderately elongate, costal margin subarcuate convex in distal three-fifths, apex rotundato-rectangulate; mediastine vein closely paralleling the costal margin, reaching to the middle of the same; costal veins non-clavate, moderately numerous, the distal ones ramifying; medio-discoidal and medio-ulnar areas very narrow, the latter faintly the wider; ulnar vein with five rami, several of which bifurcate; axillary vein with three rami; intercalated triangle very small, elongate, narrow. Seventh dorsal abdominal segment with a median gland depression; supra-anal plate strongly transverse, moderately tectate, distal margin broadly obtuse with a short median fissure, about which the margins are recurved; genital hooks consisting of a simple falciform pair, directed dorsad, and a dextral unpaired larger organ having the form of a "bill-hook"; cerci large, depressed, monili-fusiform, dorsum deplanate, venter rounded, apex moderately acute;

subgenital plate strongly asymmetrical, form shown in figure. Limbs elongate, depressed, a dorsal genicular spines present on the median and caudal femora, none on the cephalic femora. Cephalic femora armed on the ventrocephalic margin as described under the genus, of the distal spines the proximal is the shorter, the proximal portion of the same margin unarmed in the type, ventro-caudal margin with three spaced spines on distal half; median and caudal femora with margins well and regularly spined; tibiae with spines triseriate; caudal tarsi faintly shorter than the caudal tibiae, very slender, caudal metatarsus exceeding the remaining joints in length.

Allotype.—♀; Chinandega, Nicaragua. (C. F. Baker.) [Acad. Nat. Sci. Phila.]

The following features are those of difference from the description of the male sex. Form shorter and broader than in the male. Interspace between the eyes slightly more than one-half of the greatest thickness of the eye. Pronotum with oblique impressions hardly indicated. Tegmina much shorter than in male, surpassing the apex of the abdomen by hardly more than one-half the length of the pronotum, short lanceolate, greatest width contained two and one-half times in the greatest length; apex of tegmina slightly broader than in the male; marginal field slightly narrower than in male; structure of tegmina more coriaceous and with venation less apparent, particularly in the discoidal and anal fields. Wings hardly surpassing the apex of the abdomen. Supra-anal plate transverse, trigonal, distinctly U-emarginate mesad, not tectate; subgenital plate moderately ample, margin arcuate with a faint median obtuse-angulation.

General color pale maize yellow with a strongly contrasted dark pattern of mahogany red to chestnut-brown. This dark pattern is distributed over the dorsal surface as follows: a pair of broad, marginally sinuate diverging bars defining the pronotal disk laterad, enclosing an equally broad pale central area and never reaching the cephalic and rarely reaching the caudal margin of the pronotum; entire anal and discoidal fields of the tegmina, aside from a narrow elongate reniform sutural area in the anal field; dorsal surface of the abdomen with the exception of a pale marginal edging and scattered pale points. Head with a dark bar between the eyes at their point of greatest proximity, occasionally this is subobsolete; occiput varying from uniformly pale to bearing four fine dark longitudinal lines; eyes blackish fuscous, rarely ochraceous (not normal?); antennae with ventral surface of proximal and third and following joint blackish fuscous, the whole of the distal section becoming the same shade; face with a dark pattern of sinuate transverse lines, which are sometimes so solidly united as to make a dark background with a pattern of pale maize yellow spots, or again the pattern is subobsolete. Pronotum with the lateral sections subhyaline; margins of the dark bars, which latter expand in width caudad, always undulato-sinuate. Tegmina with the marginal and scapular fields subhyaline, washed with maize yellow; the border of dark area toward the costal margin subsinuate mesad, following the sutural side of the humeral trunk on proximal fourth and crossing to distinctly on the costal side on remainder of tegmen; pale area in anal field subhyaline. Wings having the veins fuscous except along the costal margin, where they are maize yellow. Abdo-

men with the depth of the dark color of the disk somewhat variable; cerci fuscous at base, on dorsal surface punctato-marginate with fuscous points, on ventral surface the segments are more or less completely divided from one another by dark margins. Ventral surface ochraceous-buff, of the abdomen more or less heavily margined laterad with fuscous, occasionally with a weaker medio-longitudinal line of the same; subgenital plate of the female largely fuscous. Ventral margins of femora lined or dotted with fuscous; tibiae infuscated at the base of the spines, the distal extremity of the tibiae infuscate; tarsi generally with several broad dark annulations.

Measurements (in millimeters)

	Length of body	Length of pronotum	Greatest width of pronotum	Length of tegmen	Greatest width of tegmen
♂					
Porto Velho, Brazil, <i>type</i> ...	11.8	3.6	5	14	5
Corozal, Panama, <i>paratype</i> 10		3	4.2	12	4
Corozal, Panama, <i>paratype</i> 10.5		3	4.3	11.5	4
Corozal, Panama, <i>paratype</i> 10.8		3.3	4.5	11.9	4.3
Old Panama, Panama, <i>para-</i> <i>type</i>	10.6	3.2	4.7	12	4.8
Pozo Azul, Costa Rica, <i>para-</i> <i>type</i>	12.5	3.7	4.8	12.6	4.4
♀					
Corozal, Panama, <i>paratype</i>	11.6	3.3	4.9	10.2	4.2
Chinandega, Nicaragua, <i>al-</i> <i>lotype</i>	11.5	3.3	5	10.4	4.3

In addition to the type and allotype we have before us five adult male and one adult female paratypes and one immature male. The data for these is as follows:

Corozal, Canal Zone, Panama, XI, 17, 1913, (M. Hebard; colony of adults and young on tree-trunk in clearing), 3 ♂, 1 ♀, *paratypes*, 1 juv. ♂, [Hebard Cln.].

Old Panama, Panama, XI, 13, 1913, (M. Hebard; running about on surface of fallen tree-trunk), 1 ♂, *paratype*, [Hebard Cln.].

Pozo Azul, Costa Rica, V to VI, 1902, (Underwood), 1 ♂, *paratype*, [Hebard Cln.].

This series shows there is an appreciable amount of variation in size, while the coloration exhibits no noteworthy variation. The ulnar vein of the wing has the number of rami varying from three to five. The spination of the ventro-cephalic margin of the cephalic femora varies as stated in footnote on page 231.

The immature male from Corozal has a color pattern close to that of similar individuals of "*Ceratinoptera*" *diaphana* (Fabricius), the network of dark markings on the dorsal thoracic and abdominal segments being very similar. In adults, however, the coloration is quite different.

On the habits of this species Mr. Hebard gives me the following information. Individuals ran rapidly about on the bark of trees and when closely pursued would fly for a short distance but always return to the surface they had left. Both adults and young were noted to exhibit exactly the same action as the bark-loving mantis *Gonatista grisea*, in suddenly arresting their movements and remaining perfectly motionless.

***Pseudophyllodromia elegans* Shelford**

1907. *Pseudophyllodromia elegans* Shelford, Ann. & Mag. Nat. Hist., (7), xix, p. 34. [Maroni, French Guiana.]

Pará, Pará. (C. F. Baker.) One male.

This specimen agrees with the original description based on a single female.

***Pseudophyllodromia boliviensis* Shelford**

1909. *Pseudophyllodromia boliviensis* Shelford, Deutsch. Entom. Zeitschr., 1909, p. 617. [Mapiri (Mapari on some maps), Bolivia.]

Pará, Pará. (C. F. Baker.) One male, one female.

Porto Velho, Rio Madeira. (Mann and Baker.) One female.

These specimens fully agree with the original description. The species is apparently quite close to *P. peruana* (Saussure).

***Pseudophyllodromia lineolata* Saussure**

1872. *Ps[eudophyllodromia] lineolata* Saussure, Mel. Orthopt., ii, fasc. 4, p. 99. [Brazil.]

Pará, Pará. (C. F. Baker.) One female.

This specimen fully agrees with the original description in every respect except several which are probably sexual, Saussure's material being of the male sex. The base color of the head is blackish instead of reddish as described, while the antennae are similarly colored except for the testaceous proximal portion. The abdomen is also almost wholly blackish.

It is quite possible that *Blatta variegata* Walker¹⁶ described from Pará may be the same as this species. If such should prove to be the case Walker's name has priority.

¹⁶ Catal. Blatt. Brit. Mus., p. 112, (1868).

NYCTIBORINAE

Nyctibora brunnea (Thunberg)

"1826. *Blatta brunnea* Thunberg, Mém. Acad. Imp. Sci. St. Petersb., x, p. 278."

Peixe Boi, east of Pará, Pará. November to December, 1907. (H. B. Merrill.) One male.

We are unable to verify Thunberg's reference, but this specimen is clearly referable to Burmeister's *holosericea*, which is identical with Thunberg's species, according to Shelford. It is closely related to Saussure's *obscura*, but is of considerably larger size, with proportionately shorter and more robust tarsi, and the supra-anal plate of the male is broadly emarginate mesad and immediately laterad of the same the margin is deeply U-emarginate, the intervening points acute. In *obscura* the same margin is rounded mesad, with shallow sinuations laterad of the same area.

Nyctibora obscura Saussure

1864. *N[yctibora] obscura* Saussure, Révue et Magasin de Zoologie, 26 ser., xvi, p. 316. [Brazil.]

Natal, Rio Grande do Norte. (W. M. Mann.) One male.

We have used this name as distinct from *N. brunnea* (Thunberg), with which it has been generally associated, as the present individual fully agrees with the description of Saussure and is distinctly under the measurements of *brunnea* as generally understood. Certain other features of difference are mentioned above under *brunnea*.

EPILAMPRINAE

Audreia heusseriana (Saussure)

1864. *Epil[ampra] heusseriana* Saussure, Révue et Magasin de Zoologie, 26 ser., xvi, p. 321. [Uruguay.]

Pará, Pará. (C. F. Baker.) One female.

Ceará, Ceará. (F. Rocha.) One female. [U. S. N. M.]

The Pará specimen has the pronotum distorted by an injury which has completely altered its outline and made deep impressions of the dark markings of the disk. The tegmina in both specimens are subquadrate, the distal margin concave in both specimens, but less so in the Pará one. In neither, however, is this margin as oblique as in Saussure's figure of the species.¹⁷

¹⁷ Mém. Hist. Nat. Mex., iv, pl. 2, fig. 24, (1864).

The present species differs from *A. hamiltoni* (Rehn), from Cuba, in the bisinuate caudal margin of the pronotum; from *catharina* Shelford, from Santa Catharina, Brazil, in the emarginate apex of the supra-anal plate of the female, and from *carinulata* (Saussure), from Central America, in the larger size, distinct venation of the tegmina, more numerous femoral spines and differences in the coloration.

The localities given above are all known for the species.

***Epilampra azteca* Saussure**

1868. *Epilampra azteca* Saussure, *Révue et Magasin de Zoologie*, 2é ser., xx, p. 356. [Mexico; Cuba.¹⁸]

Pará, Pará. (C. F. Baker.) One female.

This specimen, while slightly larger, appears inseparable from Mexican material. The penciling of the humeral trunk is less distinct in the Pará specimen and the specklings of the pronotum heavier and more numerous. The species has been recorded from Ecuador by Giglio-Tos, but not previously from eastern South America.

***Epilampra abdomen-nigrum* (DeGeer)**

1773. *Blatta abdomen-nigrum* DeGeer, *Mém. Hist. Ins.*, iii, p. 538, pl. 44, fig. 5. [Surinam.]

1903. *Epilampra abortivipenna* Rehn, *Trans. Amer. Entom. Soc.*, xxix, p. 273. [Bartica, British Guiana.]

Pará, Pará. (C. F. Baker.) One male, one female.

The above synonymy has been brought about by Shelford's redescription¹⁹ of DeGeer's type resuscitating the name *abdomen-nigrum*, which was unrecognized for over a century. The present specimens and the type of *abortivipenna* fully accord with Shelford's description.

Pará is the most southern point from which the species is known.

BLATTINAE

***Periplaneta americana* (Linnaeus)**

1758. [*Blatta*] *americana* Linnaeus, *Syst. Nat.*, Xth ed., p. 424. ["America".]

Ceará Mirim, Rio Grande do Norte. (W. M. Mann.)
One female.

¹⁸ Cuban material later separated by Saussure and Zehntner as *E. caraibea*.

¹⁹ *Trans. Entom. Soc. London*, 1907, p. 460, (1908).

Periplaneta australasiae (Fabricius)

1775. [*Blatta*] *australasiae* Fabricius, Syst. Entom., p. 271. ["In nave e mari pacifico et regionibus incognitis revertente."]

Independencia, Parahyba. (Mann and Heath.) One male, one female.

Periplaneta brunnea Burmeister

1838. *P[eriplaneta] brunnea* Burmeister, Handb. der Entom., ii, abth. ii, pt. 1, p. 503. [Chili; Demerara.]

Natal, Rio Grande do Norte. (W. M. Mann.) One male.

Eurycotis manni new species (Plate XIV, fig. 15.)

This striking new form belongs to the section of the genus formed by the species of black color with decidedly lateral lobi-form tegmina. It is distinctly larger than any of the forms to which it is related and the body coloration is entirely black. No detailed comparison of the genital characters with those of several of the allies is possible, as the latter are unknown in the male sex, but the several diagnostic characters given above are amply sufficient to distinguish the new form.

Type.—♂; Maranguape Mountains, State of Ceará, Brazil. (Stanford Expedition; W. M. Mann.) [Acad. Nat. Sci. Phila., Type no. 5246.]

Size rather large; form elliptical, subdepressed; surface moderately polished. Head projecting moderately cephalad of the pronotum; occiput and eye outline regularly arcuate; interspace between the eyes very broad, nearly three times as great as the depth of the eye; face somewhat flattened; eyes not greatly elongate, dorsal margin sinuate where covered by the pronotal margin; antennae at least two-thirds as long as the body, proximal joint nodulose proximal, second joint almost twice as long as the fourth, third joint slightly longer than the proximal one; palpi with third joint slightly longer than the fourth one, fourth joint elongate conical, fifth joint subequal to the fourth joint, moderately broad, compressed. Pronotum semiovalate, narrow cephalic margin subtruncate, broad caudal margin bisinuato-truncate, lateral margins arcuate divergent caudad, cephalo-lateral angles narrowly rounded rectangulate; surface with poorly defined shallowly impressed pattern. Mesonotum and metanotum with faintly bisinuato-truncate caudal margins. Tegmina faintly more than half as long as the pronotum, reaching to the caudal margin of the mesonotum, decidedly lateral, separated by two and one-half times their individual width, their length slightly greater than their width; costal margin gently arcuate, apex costal in position, rotundato-subacute, sutural margin gently arcuate, disto-sutural angle moderately rounded, distal margin moderately oblique arcuato-truncate; marginal field moderately defined; venation not indicated. Abdomen with the caudo-lateral angles produced, of the sixth and seventh segments subspinose; disto-dorsal abdominal segment with the

caudal margin broadly sinuato-arcuate over the greater portion of its width; supra-anal plate transverse, subquadrate, distal margin subarcuato-truncate, caudo-lateral angles obtuse rounded, lateral margins convergent caudad, concave; cerci depressed, styliform, blunted; subgenital plate transverse, distal margin bisarcuate, deeply and narrowly arcuato-emarginate at the insertion of the styles, the latter elongate, simple, tapering. Limbs robust, rather short; cephalic femora with ventro-cephalic margin bearing a series of spines of irregular length on distal two-thirds, distal extremity of cephalic face with a pair of strong spines, no dorsal genicular spine, ventro-caudal margin with four spines on distal half, distal one of the series slightly the larger; median and caudal femora each with a dorsal genicular spine and all ventral margins well armed; all tibiae with spines triseriate on dorsal face, median and caudal tibiae strongly compressed; caudal metatarsi very short, other caudal tarsal joints missing.

Color shining black; antennae black proximad, passing at proximal third into ferruginous.

Length of body, 33.5 mm.; length of pronotum, 9.5; greatest width of pronotum, 13.4; length of tegmen, 5.4; greatest width of tegmen, 3.7; length of caudal femur, 9.3.

The type is unique.

PANCHLORINAE

Panchlora exoleta Burmeister

1838. *P[anchlora] exoleta* Burmeister, Handb. der Entom., ii, abth. ii, pt. 1, p. 507. [Pará and Bahia, Brazil.]

Madeira-Mamoré Railroad Company Camp 43, Rio Madeira. (Mann and Baker.) One male.

Panchlora peruana Saussure

1864. *P[anchlora] peruana* Saussure, Révue et Magasin de Zoologie, 2é ser., xvi, p. 342. [Peru.]

Madeira-Mamoré Railroad Company Camp 39, Rio Madeira. (Mann and Baker.) Two females.

Provisionally, at least, we are using *peruana* for this species. The specific names in the genus *Panchlora* are greatly involved in uncertainty, due to the variability of the species themselves and the failure of the older, and for that matter some of the more recent, authors to mention the important genital features of their species.

Nauphoeta cinerea (Olivier)

1789. *Blatta cinerea* Olivier, Encycl. Méthod., Ins., iv, p. 314. [Mauritius.]

Pará, Pará. (C. F. Baker.) One female. [A. N. S. P.]

Manaos, Amazonas. (Mann and Baker.) One male.

This species is circumtropical in its distribution.

SCHISTOPELTIS²⁰ new genus

Related to *Tribonium* Saussure, from which, as well as all other genera of the family, it can be immediately separated by the bifissate cephalic margin of the pronotum. The genus *Schizopilia* Saussure, which also has a bifissate pronotum, can be readily distinguished by the incisions in the older genus being laterad and not cephalad in position and direction.

Generic Characters.—Form depressed. Head visible cephalad of the pronotum, with interspace between eyes broad. Pronotum transverse, caudal margin truncate, cephalic section deeply fissured on each side of the supra-cephalic portion of the disk, the fissures being arcuate, truncate at their caudal extremity and separating from the disk the wing-like lateral sections of the pronotum. Tegmina complete, venation prominent; marginal field broad. Wings complete; ulnar vein with complete and incomplete rami. Femora with no genicular spines, ventral margins unspined; tarsi with large arolia.

Genotype.—*Schistopeltis peculiaris* new species.

Schistopeltis peculiaris new species (Plate XIV, figs. 16 and 17.)

Type.—♂; Porto Velho, Rio Madeira, Brazil. (Stanford Expedition; Mann and Baker.) [Acad. Nat. Sci. Phila., Type no. 5244.]

Size medium; surface of body moderately shining. Head strongly depressed, broad, face decidedly deplanate; occipital outline subtruncate, interspace between eyes broad, nearly three times as great as the depth of the eyes, antennal scrobes much more distant than the eyes and situated deeply in the concavity of the ventral margin of the eyes; ocellar spots large; eyes very narrow, elongate reniform, greatly narrowed mesad; clypeus and labrum relatively small, transverse subrectangulate; palpi short, third joint subequal in length to the fifth and distinctly shorter than the fourth joint, fourth joint conical, fifth joint thick, somewhat inflated, in lateral outline sub-lanceolate; antennae nearly as long as the body, articles moniliform with the exception of the first and third, the former being thickened and longer than the second and third together, the third twice as long as the second. Pronotum with its length contained slightly more than one and two-thirds times in the greatest width, lateral sections depressed: cephalic margin of the disk arcuato-truncate mesad and rounding to the fissures laterad, the medio-cephalic section of the disk but little surpassing the head in width, fissures relatively broad, somewhat converging caudad, where they are abruptly truncate; cephalic margins of the lateral "wings" arcuate divergent, the cephalic angle of these sections, i. e. at the fissures, rect-acute; lateral angle of the pronotum obtuse, decided, faintly

²⁰ Σχιστος cloven, πελτη shield.

produced, caudo-lateral margins rect-convergent, crassato-cingulate, caudo-lateral angles obtuse, faintly strumose; caudal margin truncate: surface of the disk subimpressed transversely mesad, laterad near end of fissures are indicated paired sinuate sulci, which sever the black markings described under color; surface of "wings" folded, ventral surface of same deeply and broadly channelled, the angle at extremity of fissure strongly thickened and elevated. Tegmina elongate, briefly passing the apex of the abdomen, sublanceolate, greatest width contained nearly three times in the length: costal margin arcuate in proximal half, more decidedly so at the very base and weakly flattened at proximal third, from middle to distal fourth the margin is very faintly concavo-emarginate, thence rounding to the roundly acute apex; sutural margin arcuate in proximal fourth, distal fourth obliquely subtruncate to the apex, remainder of this margin straight: marginal and scapular fields broad, elongate, the former almost entirely cribroso-reticulate, the scapular and distal section of the marginal fields with regular, close and arcuate rami of the mediastine and discoidal veins; anal field elongate subpyriform, in length equal to two-fifths of the entire tegmen: venation decided, standing in relief, distad on discoidal field regularly quadrato-reticulate; discoidal vein bifurcate toward sutural margin; mediastine vein bifurcate; ulnar vein with five rami; anal vein arcuate, joining the sutural margin at nearly a right angle; axillary veins numerous. Wings faintly surpassing the apex of the abdomen, apex similar in form to that of wing; premediastine area opaque for the greater portion of its length; mediastine-discoidal and medio-discoidal areas narrow, quadrato-reticulate in proximal two-thirds; discoidal vein bifurcate at distal third; ulnar vein with four to five rami reaching the free margin of the wing and six terminating at or in the vicinity of the anal vein. Supra-anal plate transverse, broadly bilobato-emarginate distad; cerci rather short, tapering, composed of twelve very short segments, apex rather blunt; subgenital plate small, transverse, arcuate distad with pronounced juxta-cercal emarginations, in each of which is placed a minute simple style. Limbs very short.

General color shading from antimony yellow on the pronotal disk through warm buff to light buff distad on the dorsal surface of the abdomen. Head with the interocular section of the occiput ochraceous-orange, passing through ferruginous on the facial section of the same interspace into liver brown on the remainder of the face; mouth parts light orange-yellow; eyes hair brown; antennae liver brown proximad, passing into cinnamon-rufous. Pronotum shading from the antimony yellow of the greater portion of the disk into warm buff on the lateral "wings" and cephalic margin; disk with a pair of well separated broad comma-shaped fuscous marks placed on the transverse median line; margins of the fissures and caudo-lateral margins ferruginous, the caudal margin fuscous, the caudo-lateral angles more broadly so. Tegmina subhyaline except proximad on the marginal field; the venation of the marginal and anal fields warm buff, of the discoidal field walnut brown. Wings with venation whitish. Mesonotum with cephalic half chestnut brown, shading caudad into the general colors. Dorsum of abdomen with broad lateral clouds of mummy brown, paling mesad and along lateral margins within a regularly defined area much broken up by light buff dots and clouds; supra-anal plate mummy brown touched with light buff; cerci mummy brown, on dorsal surface

broadly banded on each segment with antimony yellow; ventral surface of abdomen much washed with prout's brown, more strongly so laterad, lateral spots nearly fuscous. Limbs of the ventral color, spines chestnut, black tipped; tarsi dull ochraceous buff.

Length of body, 26.8 mm.; length of pronotum, 6.3; greatest width of pronotum, 11.4; length of tegmen, 23; greatest width of tegmen, 8.2.

The type of this most remarkable genus and species is unique.

Zetobora emarginata Burmeister

1838. *Z[etobora] emarginata* Burmeister, Handb. der Entom., ii, abth. ii, pt. 1, p. 511. [Pará, Brazil.]

Pará, Pará. (W. M. Mann.) One female.

This topotypic individual fully agrees with the only published descriptions of the same sex,—the very brief original one of Burmeister and the more detailed one of the synonymous *perspicua* Walker. The emargination of the pronotal margin mentioned in the original description, and which Brunner was unable to locate, doubtless because he did not have the female sex, is quite shallow and subtle in character, but apparent immediately caudad of the lateral angle of the pronotum.

Phortioeca peruana Saussure

1862. *Z[etobora] (Phortioeca) peruana* Saussure, *Révue et Magasin de Zoologie*, 2^e ser., xiv, p. 232. [Peru.]

Madeira-Mamoré Railroad Company Camp 39, Rio Madeira. (Mann and Baker.) One female.

This specimen fully agrees with the descriptions of the species except that the supra-anal plate is decidedly less truncate. This is apparently the first exact record of the species.

BLABERINAE

Petasodes reflexa (Thunberg)

"1826. *Blatta reflexa* Thunberg, *Mém. Acad. Imp. Sci. St. Pétersb.*, x, p. 278."

Pará, Pará. (C. F. Baker.) One female. [A. N. S. P.]

Pará, Pará. (W. Mann.) One female.

Although the species and its congener *P. dominicana* (Burmeister) have frequently been referred to in the literature of the subject, and several times as common, there is almost nothing known regarding the exact distribution of the forms. From the fragmentary information before us, more complete, however, than anything in the literature, it would seem as if *reflexa* occurred in northeastern Brazil and *dominicana* in southeastern Brazil.

Blaberus parabolicus Walker

1868. *Blabera parabolica* Walker, Catal. Blatt. Brit. Mus., p. 8. [Cuenca, Ecuador.]

Pará, Pará. (C. F. Baker.) One male. [A. N. S. P.]

Manaos, Amazonas. One male. [Mus. Comp. Zool.]

Abuna, Bolivia. (Stanford Expedition.) One male, one female.

This species has been found to be distinct from *trapezoideus* Burmeister, with which it has generally been synonymized. An examination of Scudder's *Blabera armigera* show his insect to be the same as Walker's species, while Bolivar's *aequatoriana* is clearly identical. The synonymy of Bolivar's species with Walker's older *parabolicus* has already been established by Kirby. Giglio-Tos' record of *Blabera trapezoidea* from three localities in eastern Ecuador²¹ doubtless relates in its entirety to this species, as two of the specimens so determined by him from Valle del Santiago are now before us and belong to *parabolicus*.

The Pará specimen is somewhat aberrant when studied with other material, but is clearly the same species.

Blaberus scutatus Saussure and Zehntner

1894. *Blabera scutata* Saussure and Zehntner, Biol. Cent.-Amer., Orth., i, p. 118, pl. V, fig. 24. [Pernambuco, Brazil.]

Natal, Rio Grande do Norte. (W. M. Mann.) One female.

Ceará Mirim, Rio Grande do Norte. (W. M. Mann.) One male.

These specimens agree very fully with the description of the species. In this difficult genus it is very hard to make determinations without physical examination of the types, as the descriptions are by no means as comparable and comprehensive as necessary for satisfactory work.

Blaberus brasiliensis Saussure

1864. *B[labera] brasiliensis* Saussure, Révue et Magasin de Zoologie, 2é ser., xvi, p. 347. [Brazil.]

Ceará, Ceará. (W. M. Mann.) One male, one female.

Ceará, Ceará. (F. Rocha.) One female. [U. S. N. M.]

Natal, Rio Grande do Norte. (Mann and Heath.) One male.

Independencia, Parahyba. (Mann and Heath.) One male.

²¹ Bollett. Mus. Zool. Anat. Comp. Torino, xiii, p. 15, (1898).

The available descriptions of this species leave much to be desired and in consequence there exists some slight uncertainty regarding the determination of this material. The relationship of *B. scutatus* to the present form is apparently close, in fact the species, as we understand them, may be identical. Two of the Ceará specimens are slightly smaller than the others and in both of them there is a tendency toward infuscation of the proximo-sutural section of the discoidal field of the tegmina. In the male from Natal the pronotal escutcheon fails to reach the caudal margin of the pronotum, while in all the others the margin is broadly touched by the maculation.

***Blaberus biolleyi* Rehn**

1906. *Blaberus biolleyi* Rehn, Proc. Acad. Nat. Sci. Phila., 1905, p. 792, fig. 1.
[Plains of Santa Clara, Reventazon River, Costa Rica.]

Porto Velho, Rio Madeira. (M. Bolton.) One male.
[U. S. N. M.]

Caparo, Trinidad. August, 1913. (S. M. Klages.) One female.
[Hebard Cln.]

These specimens, which considerably extend the distribution of the species, show certain differences from the type, but, after a careful examination of all the available material belonging to the section of the genus containing this species, we find it impossible to locate any constant noteworthy differences except in the pronotal pattern, the paler base coloration of the pronotum and tegmina and the larger size of the Caparo female. As shown in the original figure the type has the paired pattern of the pronotal disk made up of groups of five blackish fuscous spots, diverging cephalad, and the area occupied by each paired group broadening in the same direction. In the Porto Velho male the spots are all united in two bars, which follow exactly the same outline as the groups in the type individual and are broadly fused with the black caudal margin of the disk; the small interno-caudal spots of the type are here semi-detached. The Caparo female has the infusate tendency developed a step farther, the peripheral margin of the disk pattern remaining essentially the same, but the pale central area is reduced by the presence of a pair of elongate comma-shaped spots between the cephalic sections of the dark pattern. The dark caudal margin is also broader laterad than in the other specimens. The base color of the pronotum is faintly paler, more nearly ochraceous-buff than the yellow-ocher of

the type, while the tegmina are cinnamon-buff instead of clay color. We consider the type to represent a recessive type of coloration, while the Caparo female is the intensive extreme, the Porto Velho specimen holding an intermediate position.

The measurements (in millimeters) of the three specimens before us are as follows:

	Length of body	Length of pronotum	Greatest width of pronotum	Length of tegmen	Greatest width of tegmen
♂ Porto Velho, Brazil.....	36	10.5	15.7	41	14.5
♀ Caparo, Trinidad.....	46.3	13.4	19	50	19.2
♀ Santa Clara Plains, Costa Rica, type.....	42	11.5	16.6	42	15.7

The size variation is, of course, either geographic or individual and in the present genus is quite a frequent occurrence. The male sex has never been previously examined. The only features in that sex which show noteworthy differences from the female are that the least interspace between the eyes is distinctly less than the greatest dorso-ventral depth of the eye, while the subgenital plate is of the size and form usual in this genus and moderately unsymmetrical, the dextral style situated at the bottom of an arcuate emargination. The face of the male is solidly blackish fuscous, which is true of the Caparo female as well, the ventral surface of the abdomen is solidly of the same color except for a narrow buffy lateral margin, extending from the base of the abdomen to the apex, represented on the subgenital plate by a complete but very delicate edging.

The section of the genus *Blaberus* containing *B. posticus*, *biolleyi* and *femoratus*, with other species which may be distinct from these three, or synonymous with the first and third, constitute a valid group, quite removed from the bulk of the *Blaberus* forms. The acquisition of more material and a study of the constancy of certain features may result in making necessary the erection of a genus for their reception.

CORYDIINAE

Euthyrrhapha pacifica (Coquebert)

1804. *Blatta pacifica* Coquebert, Illustr. Iconogr. Insect., iii, p. 91, pl. xxi, fig. 1. [Islands of the Pacific Ocean.]

Manaos, Amazonas. (Mann and Baker.) One male.

The other exact records of the occurrence of this circumtropical species in Brazil were from Rio de Janeiro and Pará.

OXYHALOINAE

Chorisoneura polita new species (Plate XIV, figs. 18, 18 and 20.)

A very distinct species which in general smoothness of surface somewhat resembles *Anaplecta fulgida*. The character of the femora, however, shows it has no relationship to that genus and clearly belongs to the present group.

Type.—♀; Independencia, State of Parahyba, Brazil. (Stanford Expedition; Mann and Heath.) [Acad. Nat. Sci. Phila., Type no. 5250.]

Size medium (for the genus): form moderately depressed; surface glabrous. Head projecting cephalad of the cephalic margin of the pronotum; occiput truncato-arcuate when seen from the dorsum, broad, the width about twice the depth of one of the eyes: eyes elongate reniform, narrowed at their extremities: antennae distinct, surpassing the body in length, rather sparsely but distinctly pilose; palpi with the fourth joint simple, slightly tapering; fifth joint slightly more than half again as long as the fourth joint, slender proximad, increasing in thickness to the distal third, thence narrowing to the blunt apex. Pronotum transverse subelliptical, the greatest width about twice the greatest length: cephalic margin gently arcuate, rounding by a faintly marked angle into the moderately arcuate divergent lateral margins; caudal margin arcuate laterad, truncate mesad, caudo-lateral angles broadly rounded: lateral sections of the pronotum deflexed. Tegmina surpassing the apex of the abdomen by more than the length of the pronotum, in form elongate lanceolate, the greatest width contained two and two-thirds times in the greatest length: costal margin regularly and gently arcuate; sutural margin straight except proximad and distad where it is distinctly arcuate; apex roundly subacute-angulate: marginal field narrow, reaching almost to the middle of the tegmina, deplanate; anal field acute pyriform: discoidal and median veins parallel for the greater portion of their length, costal rami of the discoidal vein about twelve in number, the same vein with two rami toward the sutural margin distad; median vein with three rami toward the sutural margin; ulnar vein simple; anal vein strongly arcuate proximad, faintly arcuate mesad and distad, reaching the sutural margin at proximal two-fifths; axillary veins about four in number. Wings with the costal margin considerably arcuate distad; appendicular field of medium size, its greatest length equal to one-third of the length of the remainder of the wing, greatest width of field distinctly exceeding its greatest length, the margin nearly semicircular, having a very slight emargination at the apex of the folding vein, the basal outline of the field nearly rectangulate: mediastine vein reaching to the distal two-thirds of the margin; discoidal vein straight, reaching to costal angle of base of the appendicular field, bearing nine costal rami which are but faintly thickened; median vein weak, rather indistinct, straight except that distad it curves toward the humeral vein; ulnar vein straight except for a short proximal arcuation, bearing a single ramus which diverges at a right

distad toward the dividing vein; axillary vein biramose, one ramus diverging mesad, the other distad; medio-discoidal area divided into ten rectangulate areas of varying size by cross nervures; medio-ulnar area with several divisions of similar character distad. Abdomen broad, depressed: supra-anal plate trigonal, arcuate-emarginate laterad, narrowly bilobate with a deep narrow sinus mesad, with long setae in the distal region; cerci elongate fusiform, depressed, with scattered elongate setae; subgenital plate broad, margin arcuate, weakly emarginate mesad. Femora without spines beneath except a strong distal spine on each margin except the cephalic ventro-caudal; cephalic femora with ventro-cephalic margin having a close series of short pile; dorsal genicular spine absent from cephalic femora, present on median and caudal femora: caudal tarsi with metatarsus faintly longer than the remainder of the tarsus: arolia large.

General color dull ochraceous-orange with the lateral portions of the pronotum and the marginal field of the tegmina clear hyaline, the ochraceous-orange of the tegmina paling distad. Eyes fuscous. Dorsal surface of the abdomen of the general color, darkening distad, ventral surface of the abdomen ochraceous-tawny, the segments laterad and distad narrowly margined with white. Limbs becoming ochraceous-buff distad.

Length of body, 6.4 mm.; length of pronotum, 2.2; greatest width of pronotum, 2.6; length of tegmen, 6.8; greatest width of tegmen, 2.3.

A badly damaged female individual from Manaos, Brazil (collected by Miss H. B. Merrill), in the collection of the United States National Museum, we have provisionally referred to this species. The Manaos specimen has lost all of the limbs and the apex of the abdomen is not perfect. If, as appears evident, this individual and the type are identical, the species has a considerable distribution.

Chorisoneura pulcherrima new species (Plate XV, figs. 23, 24 and 25.)

While apparently related to *C. discoidalis* Burmeister, the pattern of this species is so distinctive it needs comparison with none of the other forms of the genus.

Type.—♂; Pará, State of Pará, Brazil. (C. F. Baker.) [Acad. Nat. Sci. Phila., Type no. 5260.]

Size rather small: form depressed: surface glabrous. Head with the occiput largely exposed cephalad of the pronotum, broad, nearly straight in outline, the least interspace between the eyes equal to one and one-half times the greatest depth of the eye and but faintly less than the interspace between the antennal scrobes: face gently rounded: eyes when viewed from the cephalic aspect are seen to have the margins distinctly converging to the position of the interocular color band, then strongly sinuate about the antennal bases: antennae surpassing the body in length, proximal joint robust, slightly curved; second joint not quite one-half as long as the proximal one; third joint slender, slightly more than one-half as long as the proximal joint; remaining joints moniliform, very

short proximad, increasing in length distad: palpi with third and fourth joints subequal in length, slender, but fourth slightly expanding distad; fifth joint about one-half again as long as the fourth joint, of the conventional form for this segment. Pronotum transverse elliptical, deplanate, greatest length contained nearly one and three-fourth times in the greatest width, which is faintly caudad of the middle: cephalic margin gently arcuate, latero-cephalic angles hardly indicated, lateral margins broadly and strongly rounded, caudo-lateral angles but slightly more apparent than the latero-cephalic ones, caudal margin faintly arcuate: in transverse section the pronotum is gently arcuate. Tegmina slightly surpassing the apex of the abdomen, elongate lanceolate, in greater part subequal in width, the greatest width contained about three and one-half times in the greatest length: costal margin distinctly arcuate proximad and distad; sutural margin briefly but strongly arcuate proximad, the scutellum being exposed between the tegmina, distad the sutural margin is more strongly arcuate than the costal margin; apex of the tegmina narrowly rounded acute-angulate, nearer the costal than the sutural margin: marginal field narrow, well reflexed, reaching to the middle of the tegmen; scapular field broad, occupying at its greatest width about two-fifths of the entire tegminal width; anal field elongate, acute pyriform: discoidal vein arcuate proximad, thence straight to the apex, in the scapular field with nine distinct rami, some of which are bifurcate; median vein paralleling the discoidal vein but well separated from the same, bifurcate at the distal third, the sutural branch biramose, the main vein with three oblique rami proximad of the furcation; ulnar vein short, oblique; anal vein strongly arcuate proximad, thence straight oblique, reaching the sutural margin at proximal third; axillary veins three in number, well separated. Wings reaching to the apex of the tegmina: mediastine vein involved in the costal ramifications, costal veins numbering at least nine, some bifurcating, all poorly defined and weakly or not at all clavate; discoidal vein faintly sinuate proximad, elsewhere nearly straight, reaching to the proximo-cephalic angle of the appendicular field; median vein paralleling the discoidal vein, unbranched, separated from the discoidal vein by a uniform area generally less in width than the medio-ulnar area, the medio-discoidal area divided by regular cross-veins into eight to nine subquadrate sections; medio-ulnar area with several cross-veins distad; ulnar vein simple; axillary vein biramose; appendicular field with its length subequal to one-third that of the remainder of the wing at the dividing vein, semi-ovate in distal outline, basal form obtuse-angulate. Supra-anal plate transverse trigonal, the margin faintly sinuate laterad and the apex well rounded; cerci broad, depressed, incomplete in the unique type; subgenital plate short, relatively narrow as it falls far short of the width of the disto-ventral abdominal segment, the margin converging laterad and produced mesad into an acute process, which is faintly elevated distad; styles situated at the base of the process and compressed cultriform, acute, unequal in size, the dextral the larger, but of relatively similar form: of the internal genitalia elongate paired processes, having the same general divergence and direction of the styles, project distad of the external genital features, while an unpaired arcuate needle-like process is also evident. Femora unspined beneath; cephalic femora with ventro-cephalic margin bearing a distal spine; no dorsal genicular spine on cephalic femora, median and caudal

femora with distinct dorsal genicular spines: caudal tarsi with metatarsus slightly more than one-half of the total tarsal length; arolia present.

General color of head, thorax, abdomen and tegmina burnt sienna to chestnut; pronotum with disk dark seal brown. Head with a transverse bar between the most approximate portions of the eyes cream color, this having a fine median penciling of dark seal brown; eyes prout's brown; antennae and palpi buff-yellow. Pronotum with the disk solidly colored, the caudal margin pale ochraceous-buff, narrowing mesad, lateral margins broadly and cephalic margin narrowly hyaline, tinted with light buff. Tegmina with marginal field and almost all of distal two-thirds of scapular field, and a narrow costal margin connecting these two, subhyaline tinted with buffy, an oblique, faintly arcuate bar, directed disto-caudad and placed at the apex of the anal field and broadly connecting with the costal edging, of similar character. Wings strongly washed with fuscous, the region of the costal veins for a considerable section of the distal half opaque light orange-yellow. Thoracic segments and dorsal apex of the abdomen washed with seal brown. Limbs buff-yellow.

Length of body, 6.8 mm.; length of pronotum, 1.7; greatest width of pronotum, 2.7; length of tegmen, 6.8; greatest width of tegmen, 2.2.

The type of this beautiful and striking species is unique.

Chorisoneura personata new species (Plate XV, fig. 31.)

Apparently close to *C. inquinata* Saussure and *sordida* Brunner, differing from the former in the much smaller size, in the coloration of the front and vertex and in the absence of any trace of a humeral tegminal band. From *sordida* the present species differs in the fewer rami to the discoidal vein of the tegmina and the more fulvous coloration.

Type.—♀; Independencia, State of Parahyba, Brazil. (Stanford Expedition; Mann and Heath.) [Acad. Nat. Sci. Phila., Type no. 5262.]

Size small: form depressed, elongate ovate. Head but faintly projecting cephalad of the cephalic margin of the pronotum, broad, depressed: occiput gently arcuate when seen from the dorsum, the least interspace between the eyes equal to one and a half times their depth: antennae at least as long as the body, proximal joint slightly enlarged: palpi with the third joint moderately elongate, straight; fourth joint shorter than the third joint, slightly and regularly enlarging distad; fifth joint subequal in length to the third joint, rather slender, subequal proximad, tapering from the proximal two-fifths. Pronotum moderately transverse, subreniform-ovate, its greatest length contained one and a half times in its greatest width: cephalic margin relatively narrow, gently arcuate; latero-cephalic angles very faintly indicated, regularly and broadly rounded; lateral margins diverging oblique arcuate; latero-caudal angles broadly rounded; caudal margin arcuato-truncate; greatest width slightly caudad of the middle: disk arcuate dorsad when seen in section; hyaline lateral sections moderately declivent. Tegmina elongate lanceolate, very faintly surpassing the apex of the subgenital plate: costal and sutural margins regularly

arcuate, faintly flattened mesad, apex acute: marginal field of medium width and extending to two-fifths the length from the base of the tegmen; anal field acute pyriform, reaching on the sutural margin almost the same distance as the mediastine vein does on the costal margin: venation distinct, moderately elevated, strongly accentuated by all the principal, cross and accessory veins being hyaline in contrast with the general coloration; costal veins nine to twelve in number, a number bifurcate near their bases; median vein biramose to triramose; ulnar vein bifurcate; axillary veins five in number. Wings relatively narrow: appendicular field relatively small, largely intercalated, the proximal angle of the same acute, distal margin of field strongly rounded, slightly flattened mesad: costal margin of anterior field well arcuate distad, rather sharply rounding to the proximo-costal angle of the appendicular field: costal veins twelve in number, several bifurcate distad, all non-clavate; areas at the bases of the costal veins subquadrate, slightly oblique in trend; discoidal vein straight, entire; median and ulnar veins simple; medio-discoidal area with generally quadrate enclosures; axillary vein biramose. Supra-anal plate produced trigonal, the immediate apex narrowly emarginate: cerci moderately depressed, tapering, hirsute: subgenital plate compressed, subrostrate, a decided V-cleft extending proximad for a short distance along the ventral surface: oötheca carried with the carina dorsad, the carina of the same supplied with a number of regularly placed, minute, conical points. Cephalic femora with an elongate ventro-cephalic spine and no dorso-genicular or ventro-caudal spines; median and caudal femora with large ventro-cephalic, ventro-caudal and dorso-genicular spines; cephalic femora with the ventro-cephalic margin with piliiform spines; median and caudal femora with bristles on the same margin, but no spines; caudal tarsi elongate, metatarsus longer than the other joints united, arolia large.

General color chamois, beneath light to warm buff; lateral areas of pronotum, marginal and costal section of scapular fields pellucid; intervenular areas of tegmina washed with old gold, venation pellucid. Wings washed with pale clay color, stronger along the costal margin and at the base of the appendicular field than elsewhere. Head with an interocular bar of pale ochraceous-salmon, this finely outlined dorsad with fuscous, and single points of the same color placed latero-ventrad of the pale bar; antennae briefly lined with fuscous ventro-proximad; eyes blackish.

Measurements of type (in millimeters): length of body, 6.4; length of pronotum, 1.9; greatest width of pronotum, 2.5; length of tegmen, 6.2; greatest width of tegmen, 2.

We have before us a paratypic series of nine females as follows:

Independencia, Parahyba, Brazil. (Mann and Heath.)

[A. N. S. P. and Stanford University.] Five females.

Bonito, Pernambuco, Brazil. January, 1883. (A. Koebele.)

[U. S. N. M. and A. N. S. P.] Four females.

This series shows some noteworthy variational features in structure and coloration. The median vein of the tegmina, while retaining the described proportions, occasionally has four

rami, while another specimen has two of the three rami bifurcate. Again the ulnar vein is fused with the median, in which case the latter is quinque-ramose; while the most striking variation in the median vein is found in one specimen, which has it short, diverging from the discoidal vein mesad and then biramose. This latter condition is pronounced in but one tegmen, the other one having the structure more nearly approaching the normal, while the ulnar vein of the remarkable tegmen is triramose. The color variation consists of a deepening of the general color, rarely accompanied by an indefinite mottled pronotal pattern of brownish. The tegminal infumation is more brownish and less greenish-brown in these specimens.

***Chorisoneura inquinata* Saussure?**

1869. *Chorisoneura inquinata* Saussure, *Révue et Magasin de Zoologie*, 26 ser., xxi, p. 112. [Brazil.]

Ceará Mirim, Rio Grande do Norte. (W. M. Mann.) One male.

Independencia, Parahyba. (Mann and Heath.) Four males.

These specimens are appreciably smaller than the measurements of the species given by Saussure and also differ in a few apparently minor features of the coloration, but in the majority of the characters they agree with *inquinata*, which was based on the opposite sex from the material examined by us. It is probable that the differences seen by us can be accounted for by sexual diversity and so we prefer to consider them for the present.

These are the only exact localities from which the species has been recorded.

***Chorisoneura tessellata* new species** (Plate XV, figs. 26 and 27.)

Closely related to *C. gracilis* (Saussure), from which it strikingly differs in the larger size, in the antennae being wholly blackish proximad and in the wings being pale infumate.

Type.—♂; Ceará Mirim, State of Rio Grande do Norte, Brazil. (Stanford Expedition; W. M. Mann.) [Acad. Nat. Sci. Phila., Type no. 5263.]

Size relatively large (for the genus): form depressed: surface polished, venation of the tegmina distinctly raised. Head projecting cephalad of the pronotum for its full width; occipital outline truncate when seen from the dorsum; surface of the occiput rugose: interspace between the eyes equal to one and one-half times the greatest depth of the eye; antennal scrobes more distant than

the eyes: eyes elongate, narrow, strongly reniform: antennae surpassing the length of the body; proximal joint about as long as the ocular interspace, arcuate; second joint short conical, not half as long as the proximal joint; third joint subequal in length to the second one, moniliform; succeeding joints short, moniliform, piligerous: palpi with third joint elongate, slender; fourth joint about two-thirds as long as the third joint, inverted elongate conical; fifth joint of the usual elongate obtuse-angle triangle type, the length of the joint subequal to that of the third joint. Pronotum transverse subequal elliptical, the greatest length contained one and one-half times in the greatest width: cephalic margin faintly arcuate, almost imperceptibly sinuate dorsad of the eyes; lateral margins very broadly, regularly and strongly arcuate; caudal margin arcuato-truncate; in transverse section the pronotum is flattened caudad, elsewhere regularly but not strongly declivent; surface of the disk with a distinct medio-longitudinal depression, which is narrower and deeper caudad, failing to reach either the cephalic or caudal margin, laterad of this the disk shows some irregular but paired impressions and lateral diverging sulci at caudal third. Tegmina surpassing the apex of the abdomen by the length of the pronotum, acuminate lanceolate, the greatest width, which is at the proximal third, contained three times in the greatest length: costal margin strongly arcuate proximad, nearly straight distad; sutural margin straight except for a short proximal arcuation, which exposes the scutellum, and a distal convergence to the acute but narrowly rounded apex: marginal field very broad, reaching to about the middle of the tegmen, very much attenuate distad, in transverse section slightly declivent; scapular field broad at the middle of the tegmen, regularly narrowing distad; anal field pyriform: discoidal vein gently arcuate proximad, thence straight distad; costal veins strong, oblique and sixteen to seventeen in number; discoidal vein with four short rami to the sutural margin distad; median vein paralleling the discoidal vein to the distal third, thence arcuate toward and joining the sutural margin, rami of the median vein five to seven in number and frequently bifurcate; anal vein strongly arcuate proximad, straight distad except for a short arcuation at the sutural margin, which is joined at its proximal third; axillary veins four in number, with two incomplete supplementary veins. Wings moderately elongate; costal margin slightly flattened at the costal veins: appendicular field relatively small and intercalary in position, its free margin arcuate and not extending the margin of the wing, its outline proximad acute: mediastine vein anastomosing with the costal veins; discoidal vein straight, reaching to the proximo-cephalic angle of the appendicular field; median vein in general straight, distad gently approaching the discoidal vein; medio-discoidal area mesad nearly twice as wide as the medio-ulnar area and divided by cross-veins into eleven rectangulate, frequently quadrate, interspaces; medio-ulnar area with five or more short transverse veins; ulnar vein bifurcate distad; axillary vein biramose. Abdomen with the dorsal antepenultimate segment bearing a median circular glandular impression, which is rather regularly clothed with pile directed inward toward its center, a medio-longitudinal carina present within the same impression: supra-anal plate transverse, broadly trigonal; margin faintly indented mesad, the form much obscured due to shrivelling: cerci elongate, subfusiform, depressed; apex attenuate, acuminate;

individual segments well indicated, faintly constricted at the intersegmental sulci, well supplied with long hairs: subgenital plate slightly asymmetrical, strongly concavo-emarginate latero-ventrad of the cerci, moderately produced mesad; styles placed close together, elongate, heavy, compressed structures having much the form of a "bill-hook," their internal margin sulcate, the recurved apex directed meso-ventrad and the proximal half much thickened and broadened ventrad, there bearing proximad several long prominent bristles. Limbs elongate, slender: median and caudal femora unarmed beneath; cephalic femora with ventro-cephalic margin piligerous, the same limbs with two distinct genicular spines distad on the cephalic face, a single one on the caudal face, no dorsal genicular spine present; median and caudal femora with a single distal genicular spine on each face and a dorsal genicular spine: tarsi with arolia.

Pronotum, aside from the disk, the marginal field and all of the scapular field of the tegmina, except a narrow section along the discoidal vein, hyaline: disk of the pronotum ochraceous-orange, remainder of tegmina washed with dull wax yellow, the venation strongly contrasted in mustard yellow. Head with occiput ochraceous-orange, a broad dorsal interocular bar deep seal brown; face clear Naples yellow; eyes black; antennae shining seal brown, paling to buckthorn brown distad; palpi dull cinnamon-buff. Pronotum with the hyaline cephalic and caudal margins pale; disk with a pair of faint wax yellow dots caudad. Tegmina with a faint wash of ochraceous-orange along the humeral trunk proximad. Wings infumate with clay color. Abdomen dull primuline yellow. Limbs dull cinnamon-buff.

Length of body, 8.6 mm.; length of pronotum, 2.4; greatest width of pronotum, 3.6; length of tegmen, 9.7; greatest width of tegmen, 3.5.

The type of this really magnificent species is unique.

Chorisoneura lata new species (Plate XV, figs. 28, 29 and 30.)

A very distinct species, allied, however, to *C. tessellata* which it resembles in general form, from which *lata* can be readily separated by the more depressed head and greater interspace between the eyes, the absence of black from the vertex, in the presence of paired white lines on the pronotal disk and in the more ferruginous and less fulvescent wash of the interspaces of the colored portion of the tegmina.

Type.—♂; Pará, State of Pará, Brazil. (C. F. Baker.) [Acad. Nat. Sci. Phila., Type no. 5264.]

Size large (for the genus): form depressed, in outline elongate elliptico-ovoid: surface shining. Head broad, decidedly depressed; when seen from the dorsum practically the whole occiput and cephalic half of the eyes project cephalad of the pronotum, occipital outline truncate, almost imperceptibly concave when viewed from a dorso-caudal point: interspace between the eyes broad, faintly more than one and one-half times the greatest depth of the eye: eyes prominent, elongate reniform in basal outline, their greatest depth contained about two and one-half times in their greatest length: antennae

broken: palpi with third joint elongate, slender; fourth joint shorter than third, very slender at base, gently enlarging distad; fifth joint subequal to fourth joint in length, in proximal third continuing the enlargement of the fourth joint, then regularly narrowing to the apex. Pronotum transverse elliptical with a rectangulate tendency due to the squareness of the cephalic and caudal margins; greatest width slightly more than one and one-half times the greatest length: cephalic margin subtruncate with a relatively broad median section reaching from dorsad of the internal margin of one eye to that of the other eye, gently arcuate; caudal margin with the faintest arcuation; lateral margins broadly arcuate; latero-cephalic angle hardly indicated, the passage from cephalic to lateral margin being so regular; caudo-lateral angle indicated but broadly rounded; greatest width of the pronotum mesad: disk of the pronotum faintly declivent cephalo-laterad, with a distinct medio-longitudinal impression and paired lateral, sinuate, oblique indentations: lateral sections of the pronotum concave cephalad, faintly bossed over the tegminal bases. Tegmina elongate, greatest width at proximal third, thence regularly narrowing to the narrowly rounded but still acute apex: costal margin arcuate, more strongly so proximad than distad, where it is appreciably flattened; sutural margin straight except for the short but decided proximal arcuation and the distinct distal rounding to the apex: marginal field very broad, deflected into a more horizontal plane, reaching to very nearly the middle of the tegmen; scapular field quite broad, at its widest point broader than the marginal field, tapering in width distad; anal field elongate pyriform: venation well indicated, moderately raised; mediastine vein simple; discoidal vein with approximately eighteen costal rami, between the long, more prominent and proximal of which are equally well developed false nervures, which are difficult to distinguish from the true rami, distad the discoidal vein sends four rami to the sutural margin, of which one or more rami may bifurcate; median vein paralleling the discoidal vein in the median third of the tegmen, bearing three to five rami, one or more of which is bifurcate; ulnar vein simple: anal vein joining the sutural margin at the proximal third; axillary veins five in number. Wings with no true appendicular field but instead a considerable intercalated triangle, which in length is equal to approximately one-fourth that of the remainder of the wing and proximad is acute-angulate; anterior field relatively narrow: costal margin slightly flattened meso-distad: mediastine vein short, direct; discoidal vein with a strongly marked humeral branch, which bears four costal veins; costal veins about sixteen in number, the distal ones not clearly marked, all oblique toward the costal margin, but distal ones wholly oblique, moderately clavate; discoidal vein straight and unforked from humeral branching; median vein simple, faintly arcuate; ulnar vein arcuate distad, there bearing three rami; axillary vein biramose, the distal one bifurcate: humero-discoidal area with three subquadrate interspaces; medio-discoidal area faintly broader than the medio-ulnar area, occupied by fairly regular subquadrate interspaces; medio-ulnar area with only incomplete and indistinct divisions. Abdomen narrowing distad: supra-anal plate transverse, trigonal, the apex narrow and faintly emarginate, the free margin with a few relatively long bristles: cerci elongate, depressed, fusiform, distinctly attenuate distad: subgenital plate with a pair of distinct semicircular, folded impressions of the margin and of the plate situated ventrad

of the cerci; between these impressions the plate is moderately rectangulate produced and bears distad the styles, which are elongate, heavy, compressed, dagger-like structures, broad at their bases and tapering to the bluntly rounded apices, the styles are symmetrical and reach to about the distal third of the cerci. Femora unarmed beneath, margins only haired but the usual distal ventral spine large; dorsal genicular spines present on cephalic and median femora, caudal femora lacking: arolia present.

General color of the head, disk of the pronotum, and anal and discoidal and juxta-discoidal section of the scapular fields of the tegmina ochraceous-orange; lateral portions of pronotum and remainder of tegmina hyaline; the abdomen as a whole apricot yellow. Head with the face more orange-buff than the occiput, which is of the general color; at the narrowest point of the interocular space is situated a transverse bar of dull cream-white, which broadens laterad and there encloses a minute point of brownish; eyes blackish fuscous mottled with umber. Pronotum with the disk bearing a median pair of elongate comma-shaped whitish lines. Tegmina with the veins finely pencilled with milky white. Wings washed with pale ochraceous-orange, more strongly so distad. Abdomen tending toward ochraceous-orange laterad and ochraceous tawny distad. Limbs dull warm buff.

Length of body, 9.7 mm.; length of pronotum, 2.5; greatest width of pronotum 3.6; length of tegmen, 10.5; greatest width of tegmen, 3.3.

The type of this really beautiful species is unique.

Chorisoneura albonervosa new species (Plate XIV, figs. 21 and 22.)

Apparently allied to *C. calogramma* Walker, differing in the veins of the discoidal field being nearly longitudinal and in numerous features of the coloration; i. e. of the head, pronotal disk, absence of humeral streak, etc.

Type.—♂; Pará, State of Pará, Brazil. (C. F. Baker.) [Acad. Nat. Sci. Phila., Type no. 5265.]

Size medium (for the genus): form elliptico-ovoid, moderately depressed: surface polished. Head with its entire width visible cephalad of the pronotum when seen from the dorsum, the occiput truncate, the eyes regularly rounded; interocular space faintly broader than the depth of the eye: eyes reniform in basal outline, subequal in depth the greater portion of their length, shortly narrowing caudad: antennae slightly surpassing the body in length, proximal joint but faintly shorter than the ocular interspace; second joint nearly half as long as the proximal one; third joint subequal to the second; fourth and succeeding joints very short, moniliform: palpi with the third joint elongate, quite slender; fourth joint shorter than the third, regularly enlarging distad, fifth joint subequal in length to the third, relatively robust, of the form usual in the group, with the greater width at the distal third, thence regularly narrowing distad. Pronotum of the same shape as in *C. lata* but slightly less strongly transverse; surface contour identical with that of *lata* except for lacking the medio-longitudinal impression. Tegmina lanceolate, moderately acuminate, greatest width (at proximal third) contained slightly more than three times

in the length: costal margin well arcuate proximad, thence straight with a very faint sinuation; sutural margin arcuate, well flattened on median half; apex rounded acute: marginal field moderately wide, reaching to distal two-fifths of the tegmen, deplanate; scapular field broad, regularly narrowing distad from the middle of the tegmen, where the width of the field is almost one-half of the tegminal width; anal field acute, elongate pyriform: venation decided, elevated: mediastine vein arcuate distad; humeral vein sinuate mesad, much the same as but more decidedly than the costal margin, costal veins numbering about fourteen, the distal ones hard to distinguish from intercalated false nervures, which are as strongly indicated as the costal veins themselves and are between all the latter, on the internal side the humeral vein bears no true rami; median vein biramose, the rami in general longitudinal; ulnar vein biramose, the rami in general longitudinal; anal vein in distal half straight, hardly arcuate at its apex, joining the sutural margin slightly proximad of the proximal third; axillary veins three to four in number, the fourth adventitious, being indicated on the sinistral and not on the dextral tegmen. Wing with anterior field damaged; appendicular field small, also damaged: costal veins at least ten in number, bent in direction, not clavate; discoidal and median veins straight, simple; ulnar vein with a number of rectangularly diverging, short, regularly placed, incomplete cross veins caudad in distal section; axillary vein biramose: medio-discoidal area of medium regular width, divided into a number of subquadrate interspaces by straight cross veins; medio-ulnar area in general narrower than the medio-discoidal area, divided distad into subquadrate interspaces. Abdomen regularly narrowing distad; antepenultimate dorsal segment with a circular, depressed, glandular area, which is deeper proximad than distad and divided into two fairly well marked divisions by a medio-longitudinal fold: supra-anal plate transverse, the greatest length contained slightly more than twice in the greatest width, distal margin sinuato-convergent laterad to a median subtruncate section, which has a very faint median emargination and which passes roundly into the lateral sections of the same margin: cerci damaged: subgenital plate with the distal margin broadly arcuato-emarginate to receive each style, which are closely placed and between whose sockets the margin is obtuse-angulate; styles very similar to those of *C. lata* but proportionately heavier and more twisted. Femora unspined ventrad, there supplied with hairs, disto-ventral spine of the cephalic face of the cephalic femora very elongate, disto-ventral spines of both faces of the median and caudal femora shorter, dorsal genicular spine present on median and caudal femora, very elongate: arolia present.

General color of the disk of the pronotum, anal and discoidal and narrow juxta-discoidal edging of the scapular fields orange rufous; lateral portions of pronotum and marginal and remainder of scapular fields hyaline. Head blackish-fuscous, a transverse band of dull sulphur yellow at narrowest point of interocular space, immediately ventrad of which is a very fine hair line of the same color, which line also margins the eyes ventrad for a short distance; antennae of the color of the head; palpi, labrum and distal half of clypeus light ochraceous-buff; eyes prout's brown mottled with fuscous. Pronotum with the cephalic margin immediately cephalad of the disk clouded with naphthalene yellow, caudal margin for its full width narrowly clouded with white. Tegmina

with the general color very dilute in the normally covered section of the dextral tegmen; normally exposed principal venation pencilled with white, the costal veins faintly lined with the same. Wings washed with ochraceous cephalad and infusate caudad. Abdomen and thorax ochraceous-buff; limbs ochraceous buff.

Length of body, 8.2 mm.; length of pronotum, 1.8; greatest width of pronotum, 2.8; length of tegmen, 8.1; greatest width of tegmen, 2.7.

The type of this species is unique. The coloration is very striking and quite distinctive.

MANTIDAE

ORTHODERINAE

Chaeteessa filata Burmeister

1838. *Ch[ae]teessa filata* Burmeister, Handb. der Entom., ii, abth. ii, pt. 1, p. 528. [Siara (Ceará), Brazil.]

Pará, Pará. July. One female.

Porto Velho, Rio Madeira. (Mann and Baker.) One female.

The diagnostic features given by Burmeister in his very brief description are fully evident in this material, of which the Porto Velho specimen shows the following measurements: length of body, 18 mm.; length of pronotum, 3.1; greatest width of pronotum, 2.6; length of tegmen, 21; length of cephalic femur, 4.5. The Pará specimen differs from the Porto Velho one in having the fuscous cloudings of the head and pronotum much reduced, while the pattern on the limbs is as complete and intense as in the Porto Velho representative. The cerci of the Pará specimen are complete except possibly the last joint, and in length are little more than one-half as long as the abdomen.

The present records considerably extend the range of the species to the westward.

Mantoida fulgidipennis Westwood

1889. *Mantoida fulgidipennis* Westwood, Rec. Insect. Fam. Mantid., p. 28, pl. XIV, fig. 9. [Banks of the Amazons.]

Madeira-Mamoré Railroad Company Camp 39, Rio Madeira. (Mann and Baker.) One male.

This specimen fully agrees with the description of the species, but is distinctly smaller, as would be expected, the species having been described from the female sex. The dimensions of the male are as follows: length of body, 12.7 mm.; length of pronotum, 2.1;

greatest width of pronotum, 2; length of tegmen, 13.2; length of cephalic femur, 2.8.

Westwood states that the species occurred in the forest on low trees. Chopard²² has reported it from Nouveau-Chantier, French Guiana.

MANTINAE

Acontiothespis²³ brevipennis (Saussure)

1872. *A[contista] brevipennis* Saussure, Mél. Orthopt., ii, fasc. iv, p. 21, pl. 9, fig. 20. [Brazil.]

Independencia, Parahyba. (Mann and Heath.) Three males, one female.

Baturite Mountains, Ceará. (W. M. Mann.) One male.

Maranguape Mountains, Ceará. (W. M. Mann.) One female.

This species was previously known only from the female sex. It is evident that in both sexes it is close to *A. bimaculata* and in the male sex to the Central American *A. vitrea*, the female of which is not available. All of the present series have been immersed in alcohol and in consequence only structure and wing pattern can be mentioned. In *brevipennis*, when compared with *bimaculata*, the male has the lateral margins of the facial scutellum more arcuate, the pronotum is heavier with the constricted caudal section more elongate, the dorsal line more sinuate when seen from the lateral aspect, the tegmina bears a small irregular more or less pronounced maculation of seal brown mesad on the discoidal field and the wings are immaculate hyaline. From *vitrea* the male of *brevipennis* differs in the head being of a slightly different shape, in the slightly shorter though similarly shaped pronotum, which also is more decidedly constricted caudad, and in the more numerous and closely placed spines on the external margin of the cephalic tibiae. The female of *brevipennis* differs from the same sex of *bimaculata* in the same features of the head and pronotum as the males do, in the equally abbreviate

²² Ann. Soc. Entom. France, lxxx, p. 316, (1911).

²³ The genus *Acontistes* Burmeister, as has been pointed out by Saussure and Zehntner (Biol. Cent.-Amer., Orth., i, p. 130, (1894), is preoccupied by *Acontistes* Sundevall in Aves. The emendation *Acontista* of Saussure, 1870, was not proposed as a replacement, but apparently as a correction in gender, and in consequence is not available to replace the preoccupied name. As a new name for *Acontistes* Burmeister is necessary, we here propose *Acontiothespis*.

tegmina being sharper and with a relatively narrower and more evenly attenuate marginal field. The female of *bimaculata* is larger than the same sex of *brevipennis*.

A representative Independencia male measures: length of body, 17.5 mm.; length of pronotum, 4.3; greatest width of pronotum, 2.1; length of tegmen, 16.5; length of caudal femur, 4.5.

We feel convinced that the records of this species from northern Argentina and southern Bolivia refer to *A. bimaculata*.

Haglomantis superba (Gerstaecker)

1889. *Liturgusa superba* Gerstaecker, Mitth. Naturw. Ver. Neu-Vorpomm. und Rügen, xx, p. 53. [Jurimaguas, Peru.]

Igarapé de Candelaria, 8° 45' S, 63° 54' W, Rio Madeira.
(E. A. Smith.) One female. [Acad. Nat. Sci. Phila.]

Apparently this is the first record of this striking species since the original description. The specimen was badly damaged by pests before coming into our possession.

Metriomantis planicephala new species (Plate XV, figs. 32 and 33.)

A very distinct member of the genus, differing from the previously known species in the female sex having the dorsum of the pronotum tuberculate, in the different proportions of the same portion and in the shape of the facial scutellum, which has an acute angulation dorso-mesad. Doubtless a number of other features found in this species are diagnostic, such as the great flattening of the head and the general outline of the same, but regarding these the descriptions of the other forms are not sufficiently detailed to enable us to judge. The male sex of this genus was previously unknown.

Type.—♂; Ceará Mirim, State of Rio Grande do Sul, Brazil. (Stanford Expedition: W. M. Mann.) [Acad. Nat. Sci. Phila., Type no. 5270.]

Size rather small; form robust, compact. Head moderately broad, very deep, greatest depth but little shorter than the greatest width across eyes; when seen from the cephalic aspect the general form of the head is circular, slightly flattened dorsad and slightly produced ventrad in the buccal region, when seen from the dorsal aspect the head is strongly compressed cephalo-caudad, the face even faintly concave, the eyes slightly projecting cephalad of the ocellar and scutellar regions; outline of vertex, when seen from cephalic aspect, arcuate with a slight median truncation; the distance from the median section of the vertex to the dorsal margin of the facial scutellum subequal to that from the latter point to the clypeo-labial suture; ocelli small, distinct, placed in a depressed triangle; facial scutellum about one and one-half times

as wide as the greatest depth, dorsal margin arcuate brace-shaped (———), the median point sharply acute-angulate and somewhat produced, lateral margins of scutellum nearly straight, subparallel, ventral margin very faintly arcuate concave, margins of plate appreciably cingulate, surface of plate faintly concave; eyes not prominent, not breaking the regular outline of the head, internal margins nearly straight, subparallel, interspace between eyes subequal to the greatest depth of the eye; antennae filiform, not exceeding the pronotal length. Pronotum robust, rather short, with cephalic half rather broad, narrowing caudad to the narrower caudal third, which is two-thirds of the width of the cephalic section, greatest cephalic width contained slightly more than twice in the greatest length of the same; cephalic margin of the pronotum compressed arcuate, slightly and narrowly flattened mesad, passing by a distinct but blunt angle into a short, straight, subparallel section, this rounding regularly into the narrower caudal section, caudal margin arcuate with a slight median truncation; lateral margins strongly denticulate cephalad and caudad, less distinctly armed mesad, cephalic and caudal margins nearly smooth; surface of pronotum regularly tuberculate and denticulate with the exception of the caudo-lateral sections of the collar, which are unarmed; collar occupying two-fifths of the total pronotal length, transverse sulcus deeply impressed, median line sulcate caudad on collar, faintly so cephalad on shaft and weakly carinate caudad on same. Tegmina falling somewhat short of the apex of the abdomen, in length about one and one-half times that of the pronotum, broad, greatest total width contained nearly one and one-half times in the total length of the tegmen; marginal field very broad, at greatest width forming slightly more than one-third of total tegminal width; costal margin strongly arcuate, slightly flattened mesad, apex very broad, obliquely subtruncate, immediate apex sutural in position, broadly rounded, sutural margin nearly straight to the broad apex; marginal field with the transverse rami of the mediastine vein regular and but slightly oblique, humeral vein strongly and regularly arcuate, sectors of the discoidal vein regularly oblique and four in number, axillary veins four in number, anal vein moderately arcuate, reaching sutural margin slightly proximad of middle; stigma very narrow, linear, longitudinal, situated briefly proximad of middle and about one-third of greatest width of discoidal field from humeral vein. Wing falling little short of tegmina. Abdomen broad, depressed: supra-anal plate slightly transverse, produced meso-caudad in a semi-elliptical fashion; cerci not surpassing the subgenital plate, rather thick, moniliform, composed of nine articles, distal one subconical; subgenital plate ample, compressed rostrate distad. Cephalic limbs very robust; cephalic coxae very slightly shorter than the pronotum, in section strongly compressed triquetrous, dorsal margin with erect biseriate spines, the larger of which are of fair size, ventral margin with a series of numerous adpressed recurved teeth, external margin weakly tuberculate, internal face regularly and serially tuberculate ventrad, dorso-external face weakly tuberculate; cephalic femora strongly compressed, deep, greatest depth contained slightly more than three times in the greatest length of the same, dorsal margin nearly straight, ventro-external face with six teeth, proximal longer than the others, internal margin with fourteen spines increasing in length proximad, where they are biseriate in position. discoidal spines four in number, ungual sulcus at about proximal

third, margins shagreeno-tuberculate, external face tuberculate mesad; cephalic tibiae (exclusive of claw) three-fifths as long as the femur, armed on the external face with seventeen short, rather depressed spines increasing in length distad, on the internal face with thirteen distinctly longer, more arcuate spines increasing in length distad, claw very long; cephalic tibiae subequal to the tibiae; metatarsus comprising slightly more than one-half the tarsal length. Median and caudal limbs simple, moderately slender.

Coloration completely destroyed by immersion in alcohol.

Allotype.—♂; Same data as the type.

Size small; form elongate, moderately slender yet rather robust for the sex. Characters here given supplementary to the type description. Head much resembling that of the female sex but broader in proportion to the depth, the latter being three-fourths of the greatest width, and in the line of the vertex being but faintly arcuate; dorsal portion of face proportionately slightly shorter than in female; ocelli large, paired ones subcircular, ventral one slightly transverse elliptical in outline, elevated on a decided boss; facial scutellum of the same general form as in the male but dorsal margin with the median angle rectangulate and less sharply cut off from the lateral sections of the same margin; eyes with the internal margin more undulate than in the female. Pronotum similar in form to that of the female but caudal compressed section slightly more elongate, margins unarmed, surface but sparsely and weakly tuberculate; shaft non-carinate meso-caudad but with a transverse impression cephalad of the caudal margin. Tegmina elongate, probably surpassing the apex of the abdomen (this missing in the allotype), opaque in the marginal field and vicinity of the humeral trunk, subhyaline elsewhere; costal margin strongly arcuate proximad, very faintly concave thence to the broadly arcuate section of the same margin, sutural margin gently arcuate throughout, oblique subtruncate proximad, more strongly arcuate distad, apex rather narrowly rounded; rami of the mediastine vein numerous, moderately regular, oblique, discoidal field with transverse nervures generally sigmoid and often connected by irregular false intercalated longitudinal nervures; stigma elongate, linear, oblique, distad touching the humeral trunk. Wings reaching to the tegminal tips. Abdomen largely missing. Cephalic limbs in general form similar to those of the male; dorsal margin of coxae with a series of sparse, low, generally uniform, weakly recurved dentiform spines, dorsal margin practically unarmed, external margin unarmed, internal face armed as in the female but more weakly so, dorso-external face unarmed; cephalic femora slightly more than three times as long as deep, teeth of the external margin shorter and more regular in length than in the female; cephalic tibiae distinctly but not greatly exceeding the length of the tibiae exclusive of the claw. Median and caudal limbs simple, moderately slender, very strongly hirsute.

Coloration completely destroyed by immersion in alcohol.

Measurements (in millimeters)

	♂ (allotype)	♀ (type)
Length of body, Abdomen imperfect.		30.8 (slightly shrunken)
Length of pronotum,	8.9	10.3
Greatest width of pronotum,	3.6	4.7
Length of tegmen,	30.8	16.3
Greatest width of tegmen,	8 (approximately)	11.6
Length of cephalic femur,	9	11.6

In addition to the type and allotype we have before us a topotypic immature female. This individual, although but half grown, shows clearly the specific peculiarities.

MIOPTERYGINAE

Pseudomiopteryx guyanensis Chopard

1911. *P[sseudomiopteryx] guyanensis* Chopard, Ann. Soc. Entom. France, lxxx, p. 324, figs. [Saint Jean and Saint Laurent du Maroni, French Guiana.]

Pará, Pará. (W. M. Mann.) . One female.

We have compared this specimen with a cotypic pair from Saint Jean and Saint Laurent in the Hebard Collection. The Pará individual is appreciably smaller than the cotypic female, but in character is fully typical of the species. When compared with the male sex of the allied *M. infuscata* Saussure and Zehntner, from Costa Rica, Chopard's species is seen to differ in the male sex in the facial shield being less strongly transverse and the dorsal margin of the same more angulate, in the tubercles of the dorsum of the pronotum being blunter, in the smaller and more irregular reticulations of the tegmina and in the shorter and more decidedly transverse supra-anal plate.

The present record extends the range of the species to the southeastward.

Thesprotia species

Porto Velho, Rio Madeira. (Mann and Baker.) One female.

Madeira-Mamoré Railroad Camp 39, Rio Madeira. (Mann and Baker.) One male.

The male of this pair has lost the greater portion of the abdomen and its determination is accordingly very difficult, which, however, the acquisition in future of more material from the Guianas and eastern Brazil may make easier, by giving us topotypes of certain of the little known species of the older authors, described from these regions.

CREOBOTRINAE

Acanthops falcataria Goeze

1778. [*Mantis*] *falcataria* Goeze, Entom. Beytr., ii, p. 36. [No locality.]

Pará, Pará. (C. F. Baker.) One male.

This individual has been compared with a female specimen from Nouveau-Chantier, French Guiana, determined and recorded by Chopard.

Pseudacanthops caelebs (Saussure)

1869. *H[ymenopus] caelebs* Saussure, Mittl. Schweiz. Entom. Gesell., iii, p. 73. [Unknown locality, later (1870) given as "Mexico".]

Madeira-Mamoré Railroad Camp 43, Rio Madeira. (Mann and Baker.) One male.

This specimen fully agrees with a male individual from Bolivia in the Academy collection. Both specimens tally in every respect with the detailed description given in 1871 by Saussure.²⁴

Regarding the locality of the original material; first given as unknown, next as "Mexico" and last as "Orizaba, Mexico"; we feel some doubt. No one has since found the species in Mexico and we now have two definite records from the interior of South America. Might not the geographic association of the material, first considered to be from an unknown locality, have been erroneous? At any rate we will await with interest the acquisition of Mexican material to be compared with our Brazilian and Bolivian individuals.

VATINAE

Cardioptera minor new species (Plate XV, figs. 34 and 35.)

Allied to *C. brachyptera* Burmeister, but differing in the distinctly smaller size, in the less distinctly denticulate character of the caudal portion of the lateral margins of the pronotum, in the contrastingly colored marginal field of the tegmina and in the reduction of the femoral lobes.

Type.—♀; Independencia, State of Parahyba, Brazil. (Stanford Expedition: Mann and Heath.) [Acad. Nat. Sci. Phila., Type no. 5272.]

Size small (for the genus); form rather slender, abdomen strongly depressed. Head with the greatest depth comprising about four-fifths of the greatest width, front appreciably concave, the eyes and the adjacent portion of the

²⁴ Mem. Mex. Mant., p. 148.

head directed moderately latero-cephalad; occipital outline undulato-arcuate, slightly flattened mesad, the juxta-ocular sections faintly arcuato-elevate; ocelli small, distinct, arranged in a strongly depressed triangle; facial scutellum one and two-thirds times as broad as deep, dorsal margin obtuse-angulate mesad, rounded latero-dorsad, ventral margin weakly concave, surface of plate shallowly concavo-excavate; eyes elongate ovoid in basal outline; antennae filiform, equal to two-thirds the length of the pronotum. Pronotum moderately elongate, the greatest width across the supra-coxal dilation slightly less than one-third the greatest median length; collar comprising almost one-third the total pronotal length, subequal in width and with generally subparallel margins which cephalad round into the arcuate cephalic margin and caudad gently widen to the regularly rounded supra-coxal dilation, which is one and one-half times as wide as the collar; shaft relatively slender, appreciably compressed in the greater portion of its length, the margins gently expanding to the supra-coxal dilation and also to the subarcuate caudal margin, all of lateral margins biseriate denticulate, the denticulations becoming smaller and weaker caudad, on the caudal section of the supra-coxal dilation the denticulations are moderately recurved; median line shallowly sulcate on collar and cephalic portion of shaft, not distinctly marked elsewhere, surface of collar with scattered small tubercles, which are arranged in series and larger and closer bordering the median sulcus; transverse sulcus straight transverse, deep; when seen from the lateral aspect the shaft of the pronotum is slightly sinuate. Tegmina not surpassing the apex of the supra-anal plate, broad, elliptical; costal margin strongly arcuate proximad, then very gently arcuate to the distal section where the margin is more arcuate to the rounded apex, which is more sutural than costal in position, sutural margin nearly straight, shortly arcuate proximad and distad; marginal field very broad, in width constituting more than one-half of the total tegminal width, venation of the same field forming a coarse network enclosing roughly five to eight sided areas of variable size; sectors of the discoidal area regularly oblique, the cross nervures numerous and moderately regular; anal vein distinctly arcuate proximad, thence straight oblique, joining the sutural margin two-fifths the length of the latter from the base, axillary veins three in number. Wings reaching almost to the tegminal apices. Abdomen strongly depressed; supra-anal plate moderately transverse, the median section broad sublinguiform, the lateral portions narrow; cerci reaching nearly to the apex of the subgenital plate, stout, joints very short, apex moderately acute; subgenital plate compresso-rostrate. Cephalic coxae very slightly longer than the shaft of the pronotum, distinctly compressed, trigonal in section, dorsal margin biseriate spinose, the spines directed distad, the larger ones numbering six, ventral margin with eight large recurved spines, between which are smaller teeth generally placed one between each spine, external margin with a numerous series of short recurved teeth, ventro-lateral face with a few dentiform tubercles, internal face with numerous low tubercles; cephalic femora about four-fifths as long as the entire pronotum, moderately slender, greatest depth of the femora less than a fourth of the greatest length of the same, dorsal margin nearly straight, ventro-external margin with five spines of which the proximal one is larger than the subequal median three and the distal small one, discoidal spines three in number, ventro-internal margin

with thirteen spines which are biseriate in position proximad and throughout in length; cephalic tibiae (exclusive of claw) subequal to one-half the femoral length, armed on the ventro-external margin with fourteen spines, these increasing in length distad, ventro-internal margin with fourteen or fifteen spines increasing in length distad, terminal claw large; cephalic metatarsi about three-fifths of the tibial length, remaining tarsal joints about two-thirds of the length of the metatarsus. Median and caudal femora of medium length; femora with the usual distal lobe on the ventro-caudal margin represented by only the merest expansion of the margin, genicular spine aciculate; tibiae subcompressed, the dorsal margin lamellato-carinate on proximal half; caudal metatarsi equal to faintly more than a third of the tibial length.

Coloration destroyed by immersion in a liquid preservative. Marginal field of the tegmina with veins opaque and purplish-pink, their immediately surrounding section opaque yellow and the greater portion of the area much darker and translucent. Apparently when uninjured the coloration of the veins of this field is red, surrounded by borders of green or yellow.

Measurements (in millimeters)

	♀ (type)	♀ (paratype)
Length of body,	36.5	32.5
Greatest width of head,	7	6.4
Length of pronotum,	14.7	13.3
Greatest (supra-coxal) width of pronotum,	4.5	3.9
Length of tegmen,	15.5	12.7
Greatest width of tegmen,	7.6	6.9
Greatest width of marginal field of tegmen,	4	3.3
Length of cephalic femur,	11.8	10.5
Length of caudal femur,	12.3	11.3

In addition to the type we have examined a paratypic female and an immature female from Independencia. The adult is fully typical of the species but is smaller than the type, as the measurements given above show, with the tegmina and wings slightly shorter proportionately and the femoral lobes slightly more indicated than in the type, but these latter are no more than one-third as deep as the femora.

Stagmatoptera supplicaria (Burmeister)

1838. *M[antis] supplicaria* Burmeister, Handb. der. Entom., ii, abth. ii, pt. 1, fig. 542. [Surinam.]

Porto Velho, Rio Madeira. (Mann and Baker.) Two males.

These specimens are inseparable from two male individuals from Cayenne received from Chopard, except that in both of the present specimens there is an additional brownish tegminal maculation proximad of the larger oblique one present in all.

Stagmatoptera predicatoria Saussure

1870. *St[agmatoptera] predicatoria* Saussure, Mitth. Schw. Entom. Gesell., iii, p. 232. [Brazil.]

Rio Madeira five hundred miles from mouth. (Mann and Baker.) One male.

Porto Velho, Rio Madeira. (Mann and Baker.) One male.

Igarapé de Candelaria, 8° 45' S, 63° 54' W, Rio Madeira.

(E. A. Smith.) One male. [Acad. Nat. Sci. Phila.]

These specimens are quite typical of the species.

Vates multilobata (Chopard)

1910. *Zoolea multilobata* Chopard, Bull. Soc. Entom. France, 1910, p. 182, figs. 1 and 2. [St. Jean du Maroni, French Guiana.]

Peixe Boi, east of Pará, Pará. November 25, 1907. (H. B. Merrill.) One female.

This species has been placed in the genus *Vates* by Giglio-Tos²⁵, an action with which we fully agree. The very striking greenish white costal edging of the tegmina and the broad fuscous barring of the proximal two-fifths of the humeral trunk of the same, are the most striking color features of the female sex. The large pale stigma interrupts the fuscous bar of the humeral trunk.

PHASMIDAE

PSEUDOPHASMIDAE

Paraphasma conspersum Redtenbacher

1906. *P[araphasma] conspersum* Redtenbacher, Die Insektenfam. Phasmid., i, pp. 115 and 117. [Upper Amazonas, Brazil; Para, Brazil.]

Independencia, Parahyba. (Mann and Heath.) One male.

While referred to the present species this specimen shows differences from the original description, in that it is distinctly smaller and has the tubercle of the tegmina appreciably produced. These features are known to be variable in the allied *P. marginale* and, as the present individual agrees fully with the other characters of *conspersum*, we feel justified in considering it to be this species.

Pseudophasma castaneum (Bates)

1865. *Phasma castaneum* Bates, Trans. Linn. Soc. London, xxv, p. 348. [Pará, Brazil.]

Pará, Pará. (C. F. Baker.) One female.

Obidos, State of Amazonas. One female. [A. N. S. P.]

²⁵ Bollett. Mus. Zool. Anat. Comp. Torino, xxix, no. 684, p. 50, (1914).

We have gone quite carefully into the relationship of this form and *P. phthisicum* (Linn.) [= *necydaloides* Linn.] under which Redtenbacher placed it as a synonym. We have had French Guiana material of the older species determined by Chopard²⁶ for comparison, as well as other material of the genus. The Guianan *phthisicum* is, as far as we can ascertain, possessed of a more slender head and thorax, in the male at least, and a much more tuberculate dorsal surface of the same regions, particularly of the mesonotum. The marginal field of the tegmina is pale in *castaneum*, being concolorous with the anal section of the same, but a shade of greenish yellow, instead of the two being somewhat differently colored and the general contrasts less decided as in *phthisicum*, while the velvet black section is more extensive in length and breadth in *castaneum*. In *phthisicum* the antennae are pale rufescent of variable depth in the individuals we have seen. Stoll's *bioculatum*²⁷ may prove to be the same as *castaneum* and if so would have priority, but the antennae are figured as pale and we provisionally place it under *phthisicum*.

***Prisopus cornutus* Gray**

1835. *P[risopus] cornutus* Gray, Syn. Phasm., p. 43. ["India."]

Pará, Pará. One female. [Cornell University.]

This striking species was never properly recorded for locality until Redtenbacher referred material from Surinam and Cayenne to it. The very characteristic auriform head lobes will readily distinguish it from the other species of *Prisopus*.

ACRIDIDAE

ACRYDIINAE

***Eomorphopus antennatus* (Bolivar)**

1887. *A[morphopus] antennatus* Bolivar, Ann. Soc. Entom. Belg., xxxi, p. 250, pl. 5, figs. 19, 19a and 19b. [Upper Amazonia.]

Abuna, Rio Madeira. (Mann and Baker.) One female.

This species has also been recorded by us from Venezuela.²⁸

²⁶ Ann. Soc. Entom. France, lxxx, p. 339, (1911).

²⁷ Natuur. Afbeeld. Besch. Spooken, etc., pp. 61, 77, pl. xx, fig. 76, (1813). [Surinam.]

²⁸ Proc. Acad. Nat. Sci. Phila., 1904, p. 664, (1904).

Eomorphopus granulatus Hancock

1906. *E[omorphopus] granulatus* Hancock, Genera Insectorum, fasc. 48, Tetriginæ, p. 38, pl. IV, figs. 35 and 35a. [Dutch Guiana.]

Pará, Pará. (C. F. Baker.) Seven males, one female.
(W. M. Mann.) One male.

These specimens have been compared with a topotype and found to full agree. In this species we find at least four well marked chromatomorphs:²⁹ one, blackish with obsolete transverse pale fasciae on the dorsal and lateral faces of the caudal femora; another, uniform reddish; a third, ashy white; the fourth, gray brown faintly mottled with darker. The genetic value of these chromatomorphs will probably be found similar to those isolated in *Paratettix texanus* by Nabours.³⁰

Chiriquia concinna (Bolivar)

1887. *M[etrodora] concinna* Bolivar, Ann. Soc. Entom. Belg., xxxi, p. 249. [Paramaribo, Dutch Guiana.]

Pará, Pará. (C. F. Baker.) One female.

Bruner³¹ has already recorded this species from the same locality.

Otumba lobata Hancock

1906. *O[tumba] lobata* Hancock, Genera Insectorum, fasc. 48, Tetriginæ, p. 45. [Demerara,³² British Guiana.]

Manaos, Amazonas. (Mann and Baker.) Two males, one female.

These specimens fully agree with the description and Guianan material of the species. The tegmina are flavo-maculate in all the individuals.

²⁹ It is necessary to have some term to designate color form without at the same time using a word as indefinite as "variety," as definite in geographic meaning as "race," as negative a meaning in this connection as the unqualified word "form" or as teratological a meaning as "aberration." We prefer a word like chromatomorph, which expresses an idea, but at the same time does not attempt to give the origin of the concept so named. The use of the term is largely provisional, as many apparent color "forms" will in the future be shown to be Mendelian, while others as certainly will prove to be of environmental or physiological derivation. The word used merely enables one to speak of effect, while the experimental biologist is working on the cause.

³⁰ Journ. of Genetics, iii, pp. 141 to 170, (1914).

³¹ Ann. Carneg. Mus., vii, p. 99, (1910).

³² Vide Bruner, Ann. Carneg. Mus., vii, p. 111, (1910).

Otumba spinifrons (Stål)

1860. *Tetrix spinifrons* Stål, Königl. Svenska Fregatt. Eugenies Resa, Zool., i, p. 346. [Rio de Janeiro, Brazil.]

Porto Velho, Rio Madeira. (Mann and Baker.) One male.

This specimen is referred to the present species with some slight misgivings, as the cephalic femora show little indication of the "undate" margins originally described, and the caudal femora are hardly "subundate" dorsad. These features, however, show some individual variation in other forms of the group and without additional material it seems best to so consider them here. With all the other characters given for this species the present individual agrees very satisfactorily.

Bruner has recorded the species from Santarem on the lower Amazon.

Allotettix peruvianus (Bolivar)

1887. *P[aratettix] peruvianus* Bolivar, Ann. Soc. Entom. Belg., xxxi, p. 272. [Pumamarca, Peru.]

Pará, Pará. (C. F. Baker.) Twelve males, seven females.
(W. M. Mann.) One female.

Micronotus dubius Hancock

1908. *M[icronotus] dubius* Hancock, Trans. Entom. Soc. London, 1908, p. 423. ["Equatorial America."]

Pará, Pará. (C. F. Baker.) Three males.

These specimens fully agree with the brief original description of the species.

Tettigidea pulchella Rehn

1904. *Tettigidea pulchella* Rehn, Proc. Acad. Nat. Sci. Phila., 1904, p. 669. [Bartica, British Guiana.]

Pará, Pará. (C. F. Baker.) One male, one female.

The female individual is slightly larger than the type and has the wings surpassing the extremities of the caudal femora by more than the tegminal length, while in the type the wings do not surpass the femoral apices. The male has the wings projecting caudad of the pronotum a distance equal to the depth of the eye. This sex also has the face, genae, ventral portion of the lateral lobes and pleura and ventral and distal portions of the abdomen pale ochraceous. The Pará specimens show no other noteworthy differences from the female type.

Scaria hamata (DeGeer)

1773. *Acrydium hamatum* DeGeer, Mém. Hist. Ins., iii, p. 503, pl. 42, fig. 13. [Surinam.]

Peixe Boi, east of Pará, Pará. November to December, 1907. (H. B. Merrill.) One female.

Manaos, Amazonas. (Mann and Baker.) One female.

The Manaos specimen fully agrees with Trinidad material of the species, and although the tones of the coloration have been affected by spirit immersion the pattern is clearly evident. The Peixe Boi female shows some features of difference from the other specimens, but provisionally at least we prefer to refer the specimen to *hamata*.

Scaria lineata Bolivar

1887. *S[caria] lineata* Bolivar, Ann. Soc. Entom. Belg., xxxi, p. 302. [Upper Amazon.]

Pará, Pará. (C. F. Baker.) One male.

This specimen does not show the median pale line on the pronotum originally described, but the median carina is beaded with pale. As the Pará individual fully agrees with the original description in all the other characters, we feel that the intensity or continuity of this line may be an individual feature.

Paurotarsus amazonus Hancock

1900. *Paurotarsus amazonus* Hancock, Psyche, ix, p. 42, figs. 1a to 1e. [Manaos, Brazil.]

Pará, Pará. (C. F. Baker.) One female.

Manaos, Amazonas. (Mann and Baker.) One male.

These specimens are perfectly typical of this very interesting species, which Bruner has also recorded from Pará and Santarem.

From this and other material it is evident that the species is dimorphic in wing and pronotal length, the male of the present lot being of the caudate type, the female of the abbreviate form, while other females known to us are of the caudate type. As the dimensions of the female sex were previously unknown, the measurements of both individuals are given.

	♂ Manaos	♀ Para
Length of body,	11.5 mm.	14.3 mm.
Length of pronotum,	13.5 "	14.3 "
Length from fastigium to apex of wings,	15.8 "	15.2 "
Length of caudal femur,	6.8 "	9 "

Paurotarsus insolitus new species (Plate XV, figs. 36, 37 and 38.)

Allied to *P. amazonus* Hancock, but differing in the more protuberant frontal costa, in the more angulate cephalic margin of the pronotal disk, in the decided interhumeral depression of the median carina, in the distinctly beaded character of all the carinae on the dorsum of the pronotum, in the more elongate and more slender caudal femora and in the relatively much shorter caudal metatarsus, which latter is not a third longer than the distal tarsal joint instead of at least twice as long as the same. The disparity in length of the two joints is not wholly due to a reduction in size of the metatarsus, but instead is caused as much by the increase in size of the distal joint, which is actually much larger and more robust than in *amazonus*. No close relationship exists to *P. rugosus* Bruner, from Trinidad, with which *insolitus* has been compared.

Type.—♀; Madeira-Mamoré Railroad Camp 43, Rio Madeira, Brazil. (Mann and Baker.) [Acad. Nat. Sci. Phila., type no. 5277.]

Size very similar to that of *P. amazonus*; form similar. Head with the occiput rounded and arcuately passing into the distinctly arcuate-protuberant frontal costa, which is sinuate impressed at the median ocellus when seen from the side; frontal costa when viewed from the cephalic aspect with the diverging rami thick and the intervening sulcus relatively narrow, much as in *P. amazonus*: eyes moderately protuberant, semiglobose, in depth but little more than half that of the infra-ocular portion of the genae: antennae very slender, in length when extended caudad slightly surpassing the humeral angle of the pronotum. Pronotum caudate, surpassing the apices of the caudal femora by more than the greatest ventral width across the pronotal lobes, in general form similar to that of *amazonus* with the following exceptions: cephalic margin decidedly obtuse-angulate instead of subtruncate-angulate; sculpture rougher with more pronounced impressions and more elevated asperities; all carinae distinctly and rather coarsely beaded instead of subglabrous and faintly beaded as in *amazonus*; median carina of the pronotum faintly lower at the highest point than in *amazonus* and distinctly depressed and subobsolete in the inter-humeral region. Tegmina slightly narrower than in *amazonus*. Wings not quite reaching the distal extremity of the pronotum. Ovipositor slightly more slender and with blunter teeth than in *amazonus*. Cephalic and median limbs have the distal tarsal joint relatively longer than in *amazonus*. Caudal femora more elongate and more slender than in *amazonus*, the greatest width contained three times in the length instead of two and two-thirds times as in *amazonus*; dorsal and ventral femoral margins straighter: caudal tibiae more elongate: caudal metatarsi but slightly surpassing in length that of the second and third tarsal joints combined, the depth in consequence relatively greater and the pulvilli individually shorter.

General color dull cream-buff, overlaid with points, blotches and clouds of blackish brown, the carina being more or less regularly beaded with this darker color, while the dorsum of the pronotum shows dark lateral patches cephalad of the humeral angles and the femora and tibiae are much suffused with the same shade.

Length of body, 16.4 mm.; length of pronotum, 20.2; greatest width of dorsum of pronotum across the humeral angles, 4.2; length from fastigium to apex of pronotum, 21.2; length of tegmen, 3.4; length of caudal femur, 10.

The type is unique.

EUMASTACINAE

Eumastax semicaeca (Brunner)

1897. *Mastax semicaecus* Brunner, Observ. Color. Insects, pl. 15, pl. IX, figs. 118a, 118b. [Upper Amazon.]

Pará, Pará. (W. M. Mann.) One female.

Peixe Boi, east of Pará, Pará. November to December, 1907. (H. B. Merrill.) One immature male.

Abuna, Rio Madeira. (Mann and Baker.) One female.

Although these specimens have lost their natural color tones by immersion in a spirit preservative, the adults show very plainly the peculiar bicolored condition of the eyes characteristic of this species. The present records are the only definite ones known for the species, which is seen to range over a large portion of the Amazon valley.

PROSCOPINAE

Tetanorhynchus humilis Giglio-Tos

1897. *T[etanorhynchus] humilis* Giglio-Tos, Bollett. Mus. Zool. Anat. Comp. Univ. Torino, xii, no. 302, p. 18. [San Lorenzo, Argentina; Caiza and San Francisco, Bolivian Chaco.]

Baturite Mountains, State of Ceará. (W. M. Mann.)
Two females.

Baixa Verde, State of Rio Grande do Norte. (W. M. Mann.)
Five males, one female.

It was with considerable surprise that we recognized this species in the material from the extreme eastern portion of Brazil. We have before us a male and a female cotype received in exchange from Dr. Borelli and the present specimens show no differences when they are compared. In both sexes we find some variation, as usual in the group, in the relative length of the entire head and the rostrum, while in the number of spines on the caudal tibial margins there is much variation. The spine formulae of the dorsal margins of the caudal tibiae of the specimens before us are as follows:

♂					
Caiza, Bolivia (Cotype).		Misiones, Argentina.		Baixa Verde, Brazil.	
external	internal	external	internal	external	internal
10-11	8-9	17-18	18-19	11	11
				19	18
				22	20
				17	15
				19	21
				18	19
♀					
Caiza, Bolivia (Cotype).		Baixa Verde, Brazil.		Baturite Mts., Brazil.	
external	internal	external	internal	external	internal
16	13	16	15	12	14
				13	13

Giglio-Tos gave the spinulation of the two margins as eleven to fifteen, but it is evident that in the material before him the minimum was as low as eight and the maximum as high as sixteen. With an intra-specific range in the number of spines on one margin of from eight to twenty-one in the same sex, and from eleven to twenty-one in individuals from the same locality, it is evident that the number of spines is an extremely unreliable specific criterion in this group.

In his recent key to the species of this genus, Bruner³³ has misinterpreted this species, as he has placed it in a section of the genus having the apex of the rostrum blunt, when as a matter of fact it is distinctly acuminate. The male of this species can be immediately separated from the closely allied *T. bihastatus* Rehn, from Corumbá, Brazil, by the much shorter and less acuminate subgenital plate.

***Stiphra tuberculata* Brunner**

1890. *Stiphra tuberculata* Brunner, Verhandl. K.-K. Zool.-bot. Gesell. Wien, xl, p. 108. [Theresopolis, State of Santa Catharina, Brazil.]

Baturite Mountains, State of Ceará. (W. M. Mann.)

One male, two immature females.

Ceará Mirim, State of Rio Grande do Norte. (W. M. Mann.)

One female, one immature female.

Independencia, State of Parahyba. (Mann and Heath.)

Two males, one female.

³³ Ann. Carneg. Mus., viii, p. 435, (1913).

As far as can be told from Brunner's description these specimens represent the species named *tuberculata* by him, differing as they do only in the apparently less rugose meso- and metanotum. This difference is one of uncertain value, as its importance depends on the exact degree of interpretation of Brunner's, "Meso- et metanotum punctis impressis, profundis scabra." Our female specimens are all more or less distinctly but hardly decidedly scabrose on those areas. We are inclined to believe this feature is individual or environmental to a considerable degree. The exact number of spines on the dorsal margins of the caudal tibiae is of relatively little systematic value in this group, as we have shown above under *Tetanorhynchus humilis*. In the specimens before us the number of spines on the external margin ranges from nine to twelve and on the internal margin from ten to thirteen. Brunner gives eleven to thirteen external and fourteen to fifteen internal spines.

We have concluded that of the females before us but one, that from Independencia, is fully adult and that from Ceará Mirim and one from the Baturite Mountains are what Bruner calls "subimagoes,"³⁴ while the other Baturite Mountains females are distinctly young. Our reason for so considering them, aside from mere size, is that the first mentioned specimen has the rostrum greatly developed and slightly longer than the dorsal postocular portion of the head, faintly clavate and much blunted at the extremity, with the form in section tetragonal. Those considered "subimagoes" are similar to the material described by Brunner, and have the rostrum not at more or but little more than twice the length of the eye. Those considered young have the rostrum quite abbreviate and similar in relative length to that of the adult male but always blunter and broader distad. The young male has the rostrum of similar general form to that of the adult male but much shorter with a less decidedly acute apex.

The measurements of the adult female are: length of body (apex of rostrum to apices of the ovipositor jaws), 124 mm.; length of head, 23; length of rostrum, 10.7; length of pronotum, 20.4; length of meso- and metanotum and median segment, 16.7; length of cephalic femur, 12.4; length of caudal femur, 33.2; length of caudal tibia, 36.

³⁴ Ann. Carneg. Mus., viii, pp. 431, 439, (1913).

A feature found in all the specimens, but less marked in the adult female than in the others, is the presence of a blackish annular section proximad on the cephalic and median femora.

ACRIDINAE (Truxalinae of authors)

Truxalis brevicornis (Johannson)

1764. *Gryllus brevicornis* Johannson, Amoen, Acad., vi, p. 398. [Pennsylvania.³⁵]

Pará, Pará. (C. F. Baker.) One male.

This specimen is in the green phase.

Paratruxalis filatus (Walker) (*Orphula pagana* of authors, but not of Stål.)

1870. *Chrysochraon filatus* Walker, Catal. Derm. Salt. Brit. Mus., iv., p. 785. [Santarem, Brazil.]

Pará, Pará. (C. F. Baker.) One male, two females.

These specimens agree with Walker's description and are inseparable from Argentine and Paraguayan specimens. They do not approach *P. f. minor* (Giglio-Tos) of the more elevated regions of central-southern Bolivia and northwestern Argentina. The typical form is now known to range from Resistencia, Chaco and Misiones, Argentina northward over the central riverine areas to the Amazon valley, being absent, as far as known, from the eastern more elevated and coastal regions.

By an unfortunate misidentification, which has been universally followed, Giglio-Tos considered a member of the group Hyalopteryges to represent Stål's *Gomphocerus paganus*,³⁶ described from Rio de Janeiro. The genus *Orphula* was erected by Stål subsequent to his specific description, to contain *paganus* and another species, to the former of which Giglio-Tos, in the paper here referred to, restricts it by his comment, "Species typica: *O. pagana* Staol." As a matter of fact Giglio-Tos was completely in error in his association of material, but his mistake is quite pardonable, as until the present time, as far as our knowledge goes, no topotypes of Stål's species have been examined.

We have recently had an opportunity to study such material, which we will report upon elsewhere, and we can say with authority what Stål's species really is, our series fully agreeing with his rather rambling description. We also have before us a suffi-

³⁵ Proc. Acad. Nat. Sci. Phila., 1913, p. 313, (1913).

³⁶ Boll. Mus. Zool. Anat. Comp. Torino, ix, no. 184, p. 9, (1894).

ciently large series of the "*Orphula pagana*" of authors to make a proper disposition of that form.

From Stål's description we should pick out as important essentials the following: "Prothorax basi obtuse angulatus . . . carinis lateralibus ante impressionem posticam parallelis, pone eandem retrorsum distincte divergentibus. . . . Tegmina apicem versus levissime angustata, apice truncata . . . femorum posticorum apices attingentia (♂) vel vix attingentia (♀). Tibiis posticis apicem versus interdum infuscatis. . . ." These features are those of important difference in the two species and genera, as they belong to distinct genera. The Rio de Janeiro specimens, now before us, fully agree with these characters, while the "*Orphula pagana*" of authors differs in the caudal margin of the pronotal disk being subrotundate; in the lateral carinae of the pronotum being as a whole very faintly divergent, or broken mesad and then parallel cephalad and very faintly divergent caudad; in the tegmina not being narrowed distad and in both sexes the length of the same being so great they surpass the extremities of the caudal femora, and in the caudal tibiae never being as strongly infusate as in true *pagana*.

For this genus and species, so long misidentified by authors, it is necessary we should find names. From our available material we are able to determine that Walker's *Chrysochraon filatus*,³⁷ described from Santarem, Brazil, is the same as "*Orphula pagana*" of authors. Giglio-Tos's *minor*, as we have already shown,³⁸ is a geographic race of "*pagana*," or as it should be known, *filatus*. As a new generic name is required, in the absence of any available one, we propose the name **Paratruxalis**, with *Chrysochraon filatus* Walker as the type. The forms would stand as follows:

Paratruxalis Rehn

Orphula Giglio-Tos and most authors, not of Stål

Paratruxalis filatus (Walker)

Orphula pagana Giglio-Tos and most authors, not of Stål

Paratruxalis filatus minor (Giglio-Tos)

Metaleptea minor Giglio-Tos

Orphula pagana minor Rehn

³⁷ Catal. Dermapt. Salt. Brit. Mus., v, p. 785, (1870).

³⁸ Proc. Acad. Nat. Sci. Phila., 1906, p. 17, (1906); Ibid., 1913, p. 314, (1913).

Orphulella punctata (DeGeer)

1773. *Acrydium punctatum* DeGeer, Mém. Hist. Ins., iii, p. 503, pl. 42, fig.

12. [Surinam.]

Maranguape Mountains, Ceará. (W. M. Mann.) One female.

Ceará-Mirim, Rio Grande do Norte. (W. M. Mann.) One female.

Independencia, Parahyba. (Mann and Heath.) Six males, two females.

This series exhibits a number of the phases and variations of this plastic and widespread species.

Orphulella boucardi (Bruner)

1904. *Linoceratium boucardi* Bruner, Biol. Cent.-Amer., Orth., ii, p. 84. [Rio Sarstoon, British Honduras; Panama; San Diego, Department of Magdalena, Colombia.]

1906. *Orphullela* [sic] *chipmani* Bruner, Journ. N. Y. Entom. Soc., xiv, p. 149. [Interior of island of Trinidad.]

1911. *Linoceratium australe* Bruner, Ann. Carneg. Mus., viii, p. 20. [Corumbá, Brazil.]

Pará, Pará. (C. F. Baker.) Five males, three females.

Igarapé-Assu, Pará. Feb. 1, 1912 (one specimen only). (H. S. Parish.) Six males, two females. [A. N. S. P.]

Porto Velho, Rio Madeira. (Mann and Baker.) One female.

At the present moment we have before us the selected type (♂) of *Linoceratium boucardi* from Panama, now belonging to the Hebard Collection, quite a full series of topotypic *Orphulella chipmani* and a topotypic male of *Linoceratium australe*. It is clearly evident that all three names belong to the same species, and it is equally certain that *Linoceratium* is not a valid genus. Our series fully agrees with the description of *chipmani*, is inseparable from the type of *boucardi* and the Corumbá male fully agrees with the description of *australe*, but nevertheless is not separable from the others. The characters given for the genus *Linoceratium* are not of generic worth, as there is sufficient variation in a series of any size to discount the value of the subobsolete character and arcuate, straight or faintly converging form of the prozonal lateral carinae. The infuscation of the caudal genicular lobes is purely individual, depending on the depth of the general pattern. To us the species appears to be a well marked form of

the genus *Orphulella*, but not generically separable from *O. punctata*, the type of the older genus.³⁹

When compared with the well known and more common *punctata* the present widely distributed form is distinguishable by the rounded caudal margin of the pronotal disk, by the more uniformly subparallel prozonal sections of the lateral carinae of the pronotal disk, the much narrower and more acute festigium, the more deeply sinuate ventral margin of the lateral lobes and the narrower tegmina. A minor but apparently constant color difference is the absence in *boucardi* of black punctations on the ventro-lateral carina of the caudal femora, a feature which appears to be invariably indicated in *punctata*.

All the Igarapé-Assu males show no green, one of the females from the same place being in the full green and the other in the half green phase. Of the Pará males one is brown, four are in or approaching the half green phase; of the females one is full green, the other two full brown. The Porto Velho female is brown with the tegmina as thickly, though finely, sprinkled as in some individuals of *punctata*.

The Porto Velho female has the fastigium narrower than in the others of the same sex from Brazil, but in this respect it is equalled in material from British Guiana.

The range of *boucardi* is now known to extend from British Honduras, Colombia, Trinidad and British Guiana, south to Corumbá, Matto Grosso, Brazil (one male now before us), east to the eastern part of the State of Pará and west at least as far as the upper Madeira region.

In 1906, we mentioned⁴⁰ two specimens from Gualaquiza and Valle de Zamora, Ecuador, previously reported by Giglio-Tos as *O. olivacea*,⁴¹ being in our hands. We then referred them provisionally to *O. punctata*, but now are able to say they represent a form very closely related to, if distinct from, *boucardi*. They agree with *boucardi* in its important features, but have a more robust form, the female particularly showing this feature. Until more material in more satisfactory condition is available, we do

³⁹ It is quite possible that Walker's *Stenobothrus concinnulus* (Catal. Dermap. Salt. Brit. Mus., iv, p. 759, (1870)), described from Pará, is the same as *boucardi*.

⁴⁰ Proc. Acad. Nat. Sci. Phila., 1906., p. 27.

⁴¹ Boll. Mus. Zool. Anat. Comp. Torino, xiii, no. 311, p. 39, (1898).

not feel warranted in making any more definite deductions, as variation may cover the apparent differences. This Upper Amazon type is clearly Scudder's *Zonocerus* ? *bilineatus*, described from the eastern slope of the Peruvian Andes.⁴² Bruner has renamed this form *peruna*,⁴³ as *bilineatus* is preoccupied in the genus. In the original description Scudder rather curiously transposed the measurements of the antennae and the caudal tibiae.

***Compsacris pulcher* Bolivar**

1890. *Compsacris pulcher* Bolivar, Anales Soc. Españ. Hist. Nat., xix, p. 315. [Villa Bella, Peru.⁴⁴]

1911. *Staurorhectus intermedius* Bruner, Ann. Carneg. Mus., viii, p. 31. [Pará, Santarem and Chapadá, Brazil.]

Manaos, Amazonas. (Mann and Baker.) Two females.

These specimens are inseparable from a female from eastern Peru, all of which fully agree with the original description of this striking insect. Our specimens, however, have the tegmina and caudal femora slightly longer than the original measurements of the same sex.

This genus combines features of the Orphulellae and the group of genera represented by *Staurorhectus* and *Amblytropidia*, showing particular affinity to *Staurorhectus*. The general form of the female sex and to a lesser degree that of the fastigium, the frontal costa and of the lateral lobes of the pronotum of both sexes suggests the Orphulellae, while the general proportions of the pronotal disk and the form of the limbs are much as in *Staurorhectus*, the ovipositor jaws being similar to those of *Staurorhectus glaucipes*. The genus *Compsacris* also includes *Staurorhectus brevipennis* Rehn,⁴⁵ from Corumbá, Brazil, the female of which we have not seen, but which appears to differ, on the basis of opposite sexes, in the more rounded fastigium, when seen from the side, and in the absence of pale antennal tips.

When compared with *Staurorhectus longicornis*, the genotype of *Staurorhectus*, the female sex of *Compsacris* differs in the much

⁴² Proc. Boston Soc. Nat. Hist., xvii, p. 268, (1874).

⁴³ Ann. Carneg. Mus., viii, p. 16, (1911).

⁴⁴ Villa Bella, Bolivia at the junction of the Beni and Mamoré Rivers is probably the locality.

⁴⁵ Proc. U. S. Nat. Mus., xxx, p. 377, (1906).

narrower, acute fastigium, the more retreating face with more compressed frontal costa, the proportionately more abbreviate pronotal metazona, the complete structural absence of prozonal lateral carinae and in the distant instead of attingent or subattingent metasternal lobes. Bruner's *intermedius*, at least as far as the female sex is concerned, is clearly this species. The male sex of *Staurorhectus glaucipes* closely resembles *Compsacris*, with no trace of the lateral carinae, however, but the female sex, while agreeing in the distant metasternal lobes, the form of the ovipositor jaws and that of the caudal genicular lobes, differs in the form of the fastigium, the general type of the pronotum, which is without any traces of lateral carinae, the general form of the tegmina and the more slender type of caudal femora. For the present at least it seems advisable to permit *glaucipes* to remain in the genus *Staurorhectus*, which, however, is closely related to *Compsacris* through the medium of that species.

The two Manaos females agree in having the lateral pronotal carinae structurally obsolete on the elongate prozona, but in coloration one has these marked briefly cephalad by diverging pale lines, which are completely lost in the other specimen.

The species is known to range over the Amazonian region from eastern Peru and Bolivia (Villa Bella and Santa Cruz de la Sierra) to Pará and south to Chapad , Brazil.

Peruvia nigromarginata (Scudder)

1875. *Machaerocera nigromarginata* Scudder, Proc. Boston Soc. Nat. Hist., xvii, p. 268. [Eastern slopes of the Peruvian Andes.]

1890. *P[eruvia] nigromarginata* Scudder, Psyche, v, p. 439. (December, 1890.)

1891. *Toxopterus miniatus* Bolivar, Anal. Soc. Espa . Hist. Nat., xix, p. 314. (February 28, 1891.⁴⁶) [Cumbase, Peru.]

Porto Velho, Rio Madeira. (Mann and Baker.) One male.

We regret very much having to substitute generic and specific names relatively little known for the rather familiar ones of *Toxopterus* and *T. miniatus*, but this course is unavoidable. We have before us, from the collection of the Museum of Comparative Zoology, the unique female type of *Machaerocera nigromarginata* Scudder, for which the same author later erected the genus *Peruvia*. This specimen is identical with Bolivar's later genus and species. The specific name *nigromarginata* has

⁴⁶ For exact date see sheet at end of volume.

fifteen years priority and the generic name antedates *Toxopterus* by at least two months. Scudder, when erecting the genus, erroneously associated it with *Acrolophitus*, a proceeding he later⁴⁷ concluded was unwarranted, there quite correctly placing *Peruvia* near *Toxopterus*, from which he separated it by several characters. The latter for *Toxopterus*, however, were apparently gleaned from Bolivar's description and not from material, as the type of *nigromarginata* is identical with the rather extensive available series from over the extended range of the species. The type has been dried from alcohol, has in consequence the orange red wing disk turned to yellow and is now lacking the antennae and all the limbs.

The Porto Velho specimen is larger than individuals of the same sex from south-central Brazil (Chapadá), Paraguay and northern Argentina (Misiones). Additional material and further study will probably make necessary racial separation of the southern form.

***Scyllina pratensis* (Bruner)**

1904. [*Plectrotettix*] *pratensis* Bruner, Biol. Cent.-Amer., Orth., ii, p. 100. [Pernambuco, Brazil.]

Ceará-Mirim, Rio Grande do Norte. (W. M. Mann.) One male.

This species is only known from the two localities.

OEDIPODINAE

***Paulinia acuminata* (DeGeer)**

1773. *Acrydium acuminatum* DeGeer, Mém. Hist. Ins., iii, p. 501, pl. 42, fig. 10. [Surinam.]

Independencia, Parahyba. (Mann and Heath.) One male.

Pará, Pará. (C. F. Baker.) One female.

Manaos, Amazonas. (Mann and Baker.) Six males, sixteen females.

The Manaos series shows an appreciable amount of variation in the fastigial width in both sexes, more pronounced, however, in the female. The chromatomorphs are very strikingly different and appear to us to be genetic combinations, probably much like those illustrated by Nabours in his paper on heredity in *Paratettix*. The male sex shows much greater uniformity in coloration than the female, but this may be due to the smaller

⁴⁷ Proc. Boston Soc. Nat. Hist., xxvii, p. 207, (1896).

size of the male series. We have been permitted to examine the unique female type of *Coelopterna stalii* Scudder, from the Peruvian Marañon, and find it to be identical with DeGeer's species. This position has been assigned by some workers, but no one has done so previously from a type examination.

The species is wide spread in tropical America, and is generally referred to in the literature as *Coelopterna acuminata*, but the generic name *Paulinia* has priority.

OMMEXECHINAE

Ommexecha giglio-tosi Bolivar

1899. *O[mmexecha] giglio-tosi* Bolivar, Revista Chilena Hist. Nat., iii, p. 54, 55. [Caiza, Aguarenda and San Francisco, Bolivian Chaco.]

Peixe Boi, east of Pará, Pará. November to December, 1907. (H. B. Merrill.) Two males.

These specimens are not specifically separable from individuals of this species previously recorded by us from northern Argentina.

PYRGOMORPHINAE

Algete brunneri Bolivar

1905. *Algete brunneri* Bolivar, Boletin R. Soc. Españ. Hist. Nat., v, p. 214. [Pernambuco, Brazil.]

Baixa Verde, Rio Grande do Norte, Brazil. (W. M. Mann.)
One female.

Ceará Mirim, Rio Grande do Norte, Brazil. (W. M. Mann.)
One female.

These specimens are perfectly typical of this peculiar genus and species, which is known only from extreme eastern Brazil.

Omura congrua Walker

1870. *Omura congrua* Walker, Catal. Derm. Salt. Brit. Mus., iii, p. 504. [Pará, Brazil; Amazon Region; Archidona, Ecuador.]

Manaos, Amazonas. (Mann and Baker.) One female.

Pará, Pará. (C. F. Baker.) One male.

Peixe, Boi, east of Pará, Pará. November to December. (H. B. Merrill.) One female, two immature females.

The variety *brunneri*, described by Bruner⁴³ from Demerara, is clearly no more than an individual variation. The general size and antennal size differences given as diagnostic are of no

⁴³ Ann. Carneg. Mus., viii, p. 42, (1911).

taxonomic value, as extremes of these conditions and intermediates are in a series of fifteen males and four females from Bartica, British Guiana, now before us. We are unable to find in our series any appreciable difference in the surface of the body, which is said to be smoother in *brunneri*. The immature females are in different instars.

LOCUSTINAE

Prionolopha serrata (Linnaeus)

1758. [*Gryllus (Bulla)*] *serratus* Linnaeus, Syst. Nat., X ed., p. 427. ["Indiis."]

Pará, Pará. (C. F. Baker.) One male.

Diedronotus angulatus (Stål)

1873. *T[ropinotus] angulatus* Stål, Öfv. Kong. Vet.-Akad. Förh., 1873, no. 4, p. 52. [Bahia, Brazil.]

Ceará, Ceará. (W. M. Mann.) One male.

Baturite Mountains, Ceará. (W. M. Mann.) One male, one female.

Natal, Rio Grande do Norte. (W. M. Mann.) One male.

Ceará-Mirim, Rio Grande do Norte. (W. M. Mann.) Two males, three females, one juv. male.

Baixa Verde, Rio Grande do Norte. (W. M. Mann.) One female, one juv. female.

Independencia, Parahyba. (Mann and Heath.) Three males, four females.

These specimens have all been immersed in alcohol and in consequence have lost much of their original coloration. Certain individuals—all of the Independencia males, one of the Ceará-Mirim males and the males from Ceará and Baturite Mountains, and one Ceará-Mirim and one Independencia female—have a strongly contrasted pattern sprinkled with umber points, more or less thickly according to the individual. The broad infusate bars along the lateral portions of the pronotal disk are indicated in several of the pale females, as is frequently the case in *D. discoideus*.

Brunner's *D. mexicanus* is closely related to *angulatus*, more so than to *D. discoideus*. The present records, with that of the typical material and one from Bonito, Pernambuco, Brazil, are the most eastern for the species, which ranges southward to Paraguay and northern Argentina and westward to Peru.

Chromacris stollii Pictet and Saussure

1887. *R[homalea] stollii* Pictet and Saussure, Mitth. Schweiz. Entom. Gesell. vii, p. 351. [Bahia, Brazil.]

Baixa Verde, Rio Grande do Norte. (W. M. Mann.) One female.

Pará, Pará. (C. F. Baker.) One male.

Titanacris albipes (DeGeer)

1773. *Acrydium albipes* DeGeer, Mém. Hist. Ins., iii, p. 487, pl. 40, fig. 7. [Surinam.]

Igarapé de Candelaria, 8° 45' S, 63° 54' W, Rio Madeira. (E. A. Smith.) One female. [A. N. S. P.]

This specimen, which is in perfect condition except for the antennae and one tarsal joint, has the original coloration completely preserved. The colored spur of the wing is not greenish as is the apex, but instead is dull dusky violet (Ridgway), well contrasted with the remaining areas of the wing.

The previous definite records are from Surinam and Pará, Rio de Janeiro and Lago Alexo, Brazil.

Tropidacris latreillei (Perty)

1830. *Acrydium latreillei* Perty, in Spix and Martius, Delect. Anim. Art., p. 123, pl. XXIV, fig. 4. [Amazon River.]

Igarapé de Candelaria, 8° 45' S, 63° 54' W, Rio Madeira. (E. A. Smith.) One female. [A. N. S. P.]

Porto Velho, Rio Madeira. (H. N. Benton.) One female.

The remarks previously made by us regarding the relationship of *T. dux* and *latreillei*⁴⁹ hold true regarding this material.

Tropidacris collaris (Stoll)

1813. *Gryllus (Locusta) collaris* Stoll, Natuurl. Afb. Beschryf. Spookten. etc., Trek-Springhaanen, pp. 39, register 13, pl. xxiB, fig 80. [No locality.]

Ceará-Mirim, Rio Grande do Norte. (W. M. Mann.) Three males.

Independencia, Parahyba. (Mann and Heath.) One male.

Pará, Pará. (C. F. Baker.) One male.

Manaos, Amazonas. (Mann and Heath.) One female.

1905. (Bicego.) Two males. [Submitted by Dr. H. von Ihering.]

This species generally figures in the literature as *T. cristata*. All of the above specimens except the Pará and the two Manaos

⁴⁹ Proc. Acad. Nat. Sci. Phila., 1913, pp. 88 to 89, (1913).

males have been immersed in a liquid preservative, and in consequence their coloration is practically gone.

The species has been recorded from a number of Brazilian localities.

Leptysma filiformis (Serville)

1839. *Opsomala filiformis* Serville, Hist. Nat. Ins., Orth., p. 593. [The North of the State of São Paulo, Brazil.]

Ceará, Ceará. (W. M. Mann.) One male.

Independencia, Parahyba. (Mann and Heath.) Three males, one female.

Pará, Pará. (C. F. Baker.) One male, one female.

The Ceará and Independencia specimens show some features of difference from the Pará and other determined individuals, particularly in the male sex, but there is so much individual variation in this genus in certain features, as the form of the fastigium, we wish to defer any detailed comment until larger series than those now in hand are available. The identification should be considered provisional.

Stenacris cylindroides (Stål)

1860. *Opsomala cylindroides* Stål, Kög. Svenska Freg. Eugenies Resa, Ins., p. 325. [Rio de Janeiro, Brazil.]

Pará, Pará. (C. F. Baker.) One male.

Oxyblepta xanthochlora (Marschall)

1835. *Gryllus xanthochlorus* Marschall, Ann. Wiener Mus., i, p. 215, pl. XVIII, fig. 7. [Brazil.]

Pará, Pará. (C. F. Baker.) Two females.

These specimens are only provisionally referred to this species, as the northern South American forms of this genus are very poorly understood.

Cornops longicorne (Bruner)

1911. *Paracornops longicorne* Bruner, Ann. Carneg. Mus., viii, p. 82. [Pará, Brazil.]

Pará, Pará. (C. F. Baker.) Two males, one female.

We have been fortunate enough to have for comparison, in connection with this species, two very interesting specimens; one, the type of Scudder's *Cornops bivittatum*, and the other a topotype (Surinam) of DeGeer's *longipenne*; belonging to species both of which have perplexed students for some time. Unfortunately the decisions most favored in the past have been errone-

ous in both cases. The type of Scudder's genus *Cornops* is *bivittatum*, based on a unique female from the eastern slope of the Peruvian Andes. This specimen has been dried from alcohol and in consequence all of the coloration except the striking black pattern is missing, but the structural features are completely preserved. A most casual examination shows that the species does not belong to the genus *Cornops* as restricted by Giglio-Tos,⁵⁰ but instead it is fully typical of *Paracornops* there described by him. In consequence *Paracornops* falls as a synonym of *Cornops*. At the present writing I am not acquainted with the insect called *Cornops* by Giglio-Tos.

The Pará specimens are fully typical of *longicorne*, which is a close relative of *longipenne* (DeGeer), described from Surinam. Bruner has erroneously determined as *longipenne* a species from São Paulo, Brazil,⁵¹ material of both sexes of which, as well as a topotypic (Paramaribo, Surinam; K. Mayo) female of *longipenne*, is now before us. We have elsewhere named the species erroneously determined by Bruner, while a comparison of the female of *longipenne* and the same sex of *longicorne* show the following important differences: fastigium in *longipenne* broader than long and transverse, instead of subtrigonal and hardly broader than long as in *longicorne*, margins of the same thickened and incrassate in *longipenne*, sharper and more narrow in *longicorne*; fastigio-facial angle of *longipenne* more rounded than in *longicorne*; facial line not as straight in *longipenne* as in *longicorne*, faintly arcuate; frontal costa distinctly broader in *longipenne*, distinctly constricted at the ocellus instead of non-constricted as in *longicorne*, hardly sulcate dorsad of ocellus instead of distinctly so as in *longicorne*; lateral ocelli larger and more circular in *longipenne*, smaller and elliptical in *longicorne*. Tegmina of *longipenne* with apex more regularly rounded and less acuminate than in *longicorne*. Prosternal spine of *longipenne* blunt, subcylindrical, slightly transverse; of *longicorne* sharply acuminate, rising from a transverse pyramidal structure. Dorsal ovipositor jaws of *longipenne* with about eleven rather fine marginal teeth and fine discal teeth; of *longicorne* with four to five large and other small marginal teeth and coarse discal teeth. Cerci of *longipenne* thick, short, tapering, blunt; of *longicorne*

⁵⁰ Boll. Mus. Zool. Anat. Comp. Torino, ix, no. 184, p. 31, (1894).

⁵¹ Proc. U. S. Nat. Mus., xxx, p. 662, (1906).

more slender, hardly tapering. Genicular lobes of caudal femora of *longipenne* sharply acuminate, lanceolate produced; of *longicorne* but moderately acute-angulate, not sharply produced. Caudal tibiae of *longipenne* strongly expanded distad, markedly lamellate and with the marginal fringe well developed; of *longicorne* much less expanded distad, but little lamellate and marginal fringe very weak. Caudal tarsi of *longipenne* much elongate; of *longicorne* shorter, both actually and proportionately. The coloration is of the same general type in both species.

When the type of *Cornops bivittatum* Scudder is compared with the female of *longicorne* the two are seen to be very closely allied, in fact much more closely than *longicorne* and *longipenne*. The antennae of *bivittatum* are somewhat longer than in *longicorne*, the interspaces between the sternal lobes are broader, the ovipositor jaws are proportionately shorter and broader and the caudal tibiae are slightly more expanded and sublamellate distad, although much less so than in *longipenne*. The coloration of *bivittatum* was, apparently, the same as that of *longicorne*, before it was damaged by liquid preservative.

Coplocera prasina new species (Plate XV, figs. 39 and 40.)

A striking new species of this interesting genus, differing from all the other forms in the abdomen having no decided yellow, red or orange lateral patches, in the caudal femora lacking the distinctive dorsal yellow area found in the other species and in the annulate cephalic femora and tibiae. It is nearer to *laeta* Gerstaecker than any other species, but it also differs from that in the slightly broader body, the broader eye, the practically non-sulcate frontal costa, the narrower tegmina and in the less infusate periphery of the wings.

Type.—♀; Pará, State of Pará, Brazil. (C. F. Baker.) [Acad. Nat. Sci. Phila., Type no. 5285.]

Size rather large: form as usual in the genus, less robust than in *C. austera*, not as slender as in *laeta*, very similar to *C. erythrogastra*; surface of face, lower genae, pronotum and pleura finely cribroso-punctate. Head with the exposed dorsal surface four-fifths as long as that of the pronotum: occiput very faintly arcuate, not elevated dorsad of the pronotum, slightly declivent on the vertex, the interocular width slightly exceeding the greatest width of the frontal costa; fastigium slightly depressed below the level of the occiput, in form moderately acute with the immediate apex blunted, a delicate medio-longitudinal sulcus present: fastigio-facial angle, when seen from the lateral aspect, rounded obtuse-angulate, face regularly and considerably retreating; frontal costa

subequal in width, strongly constricted dorsad at its junction with the fastigium, slightly expanded around the ocellus, subobsolete ventrad on the face, irregularly biseriate punctate dorsad, roughly excavato-sulcate for a short distance dorsad and a great distance ventrad of the ocellus; lateral facial carinae well elevated, strongly diverging ventrad, sinuate: eyes moderately prominent, ovoid in basal outline, slightly flattened cephalad, in length about one-half again as long as the infra-ocular portion of the genae: antennae elongate, two and one-half times as long as the dorsal length of the pronotum, slightly depressed proximad, apex weakly acuminate. Pronotum subcylindrical, the greatest caudal width of the dorsum contained one and two-thirds times in the dorsal length of the same, the dorsal line straight when seen from the side; cephalic margin of the disk subarcuate, slightly flattened mesad, caudal margin obtusely rounded: median carina low but precurrent, very weak mesad and more decided on the metazona, lateral angles rather broadly rounded; metazona equal to two-thirds the length of the prozona; transverse sulci well indicated, deeper on the lateral lobes than on the dorsum: lateral lobes with their greatest dorsal length one and one-half times as long as the greatest depth of the lobes; cephalic margin of the lobes nearly vertical, truncate, ventral margin rather shallow arcuate-emarginate cephalad, truncate caudad with a bulbous thickening of the extreme caudal section of the same, caudal margin weakly sinuate, subtruncate, ventro-caudal angle rounded. Tegmina reaching to the apex of the abdomen, slender: costal margin distinctly and regularly arcuate distad to the narrowly rounded apex, which is more sutural in position. Wings reaching to the tegminal tips: greatest width contained two and one-quarter times in the greatest length of the same; apex of anterior field narrowly rounded. Prosternal process of the broadly transverse type found in the genus, thick, distal margin hardly emarginate, lateral angles blunt, rounded; interspace between the mesosternal lobes narrow, hour-glass shaped, the narrowest point hardly more than a fourth of the length of the same interspace, the internal margins of the lobes roundly obtuse-angulate; metasternal lobes subcontiguous caudad. Cerci and ovipositor valves elongate, simple, the former tapering on distal portion, the latter blunt and faintly bulbous at the tips, without marginal teeth. Cephalic and median limbs small. Caudal femora slightly more than half the length of the tegmina, pattern of the paginae regular and well impressed: caudal tibiae about four-fifths as long as caudal femora, armed on the external margin with seven to eight spines,⁵² internal margin with nine to ten spines; caudal tarsi with the second joint about three-fifths as long as the metatarsus, the third joint but slightly shorter than the first and second joints together.

General color of dorsal and lateral surfaces cedar green, the abdomen pale cendre green. Head with the margins of the fastigium and of the fastigial angles blackish; ocelli orange-yellow; eyes auburn; mandibles bay, touched with ox-blood red proximad; clypeus and labrum sanford's brown, the ventral margin of the genae weakly and unevenly lined with wax yellow; antennae black, the proximal joint and a dorsal edging on the next five to six joints dragon's-blood red, six distal joints ochraceous-orange. Pronotum with the

⁵² On one limb there is present in the unique type a distal external spine, a condition not normal in the group.

thickened ventral margin of the lateral lobes and the contiguous prosternal lobe edged with wax yellow, median line of pronotum weakly lined with zinc orange, stronger cephalad. Tegmina smoky fuscous with the venation of the general color. Wings largely weakly washed with fuscous, the proximal section of the disk washed with pale methyl blue. Prosternal process dull buckthorn brown, ventro-cephalic section of the mesopleura and cephalic section of the mesosternum washed with madder brown. Abdomen apparently uniform pale cendre green without the usual dark rings and yellow, orange or red areas of other species of the genus. Cephalic and median limbs of the general color, but the proximal half of the femora and also the same section of the tibiae, as well as a wash on the tarsi, nopal red. Caudal femora of the general color with the internal genicular arch and a portion of the lobe blackish; caudal tibiae nopal red, the internal face of the proximal extremity washed with blackish, spines orange-buff tipped with black; caudal tarsi washed with nopal red.

Length of body, 41 mm.; length of pronotum, 6.9; greatest dorsal (caudal) width of pronotum, 4.2; length of tegmen, 31.2; length of caudal femur, 18; length of caudal tibia, 15.

The type of this handsome species is unique.

***Coplocera erythrogastra* (Perty)**

1834. *Xiphicera erythrogastra* Perty, Delect. Anim. Articul., p. 122, pl. XXIV, fig. 2. [Mountains of the Province of Minas Geraes, Brazil.]

Abuna, Rio Madeira. (Mann and Baker.) One female.

This specimen has been compared with a Goyaz, Brazil, individual of the species and it is not separable. It is, however, somewhat larger and has the black areas on the sides of the abdomen smaller, less bar-like and of little vertical extent, while the bluish is absent from the base of the wing. The latter condition can be accounted for by the specimen having been in a liquid preservative, which has destroyed or seriously injured other features of the coloration.

The species was recorded by Gerstaecker from Olivença, Brazil and Pebas and Iquitos, Peru, in the upper Amazon basin.

***Coplocera surinamensis* Rehn**

1913. *Coplocera surinamensis* Rehn, Proc. Acad. Nat. Sci. Phila., 1913, p. 94, figs. 7 and 8. [Surinam.]

Peixe Boi, east of Pará, Pará. November to December, 1907. (H. B. Merrill.) One male.

This is the first record of the species from Brazil, or in fact since the original description. The abdomen of this specimen has the lateral patches aniline yellow, the antennal tips of the same shade.

Copiocera austera Gerstaecker

1889. *Copiocera austera* Gerstaecker, Mitth. Naturwissen. Ver. Neu-Vorpomm. und Rügen, Greifswald, xx, p. 36. [Iquitos, Peru.]

Madeira-Mamoré Railroad Camp 41, Rio Madeira. (Mann and Baker.) One female.

This specimen agrees with the description excepting in the absence of bluish from the base of the wing. As the individual has been in a liquid preservative, has the usual position of the bluish area pale, and we have material of *erythrogastra* in the same series with bluish removed from the same region by the preservative, we can safely assume this has happened in the present specimen.

Walker's *nigricans*,⁵³ from Nauta, is either very close to or identical with *austera*.

Coscineuta sordida new species

A dull colored species, which differs from *C. coxalis* in the more shallowly impressed transverse sulci of the pronotum, the proportionately shorter cephalic and median femora, the absence of red from the coxae, the ochraceous wash on the strumosity of the head, pronotum and pleura, and other color features. From *virens* the new species differs in the deep glaucous caudal tibiae, the differently colored caudal tarsi, and numerous other color features. From *cicatricosa* the new form differs in the deeper general coloration and the color pattern of the caudal femora. Unfortunately, so little in the way of structural characters are given in the descriptions of *virens* and *cicatricosa*, we have to resort to color differences as diagnostic. Bruner's *olivacea* is a much smaller insect and appears to be so different as to require no comparison.

Type.—♀; Peixe Boi, east of Pará, State of Pará, Brazil. November to December, 1907. (H. B. Merrill.) [Acad. Nat. Sci. Phila., Type no. 5313.]

Size rather large; form robust; surface of head, pronotum and pleura rugulose to rugoso-cicatricose, of the venter and abdomen glabrous to glabroso-punctulate. Head no wider than the cephalic section of the pronotum: occiput gently rounded, gently descending to the interocular space, ruguloso-punctulate; interocular space hardly as wide as the frontal costa at the infra-ocular constriction, weakly sulcate: fastigium short, strongly transverse, the disk deeply ruguloso-punctate: fastigio-facial angle rather narrowly rounded when seen from the side, the face slightly retreating from between the antennae

⁵³ Catal. Dermapt. Salt. Brit. Mus., iv, p. 653, (1870).

bases; frontal costa broad dorsad, not sulcate but sparsely biseriate punctate, ventrad of ocellus sharply narrowed, lineato-sulcate, the margins strumose and merging with the strumose ventral border of the face; laterad of the frontal costa, ventrad of the ocellus, rectangulate strumosities join the costal margins; supplementary facial carinae distinct, strumose, irregular, moderately diverging; remaining surface of the face and genae rugoso-strumose: eyes not decidedly prominent, flattened ovate in basal outline, their greatest depth twice that of the infra-ocular portion of the genae: antennae elongate, two and one-quarter times as long as the dorsum of the pronotum, slender. Pronotum short, robust, rugoso-cicatricose: greatest dorsal (caudal) width of disk contained one and two-fifths in the greatest length of the same; cephalic margin of disk faintly emarginate mesad, caudal margin of disk rounded obtuse-angulate, the immediate angle flattened; median carinae weakly indicated cephalad, obsolete mesad, distinct but low and connected with the strumose pattern on the metazona; transverse sulci broadly and continuously indicated, all severing the median carina, relatively shallow: lateral lobes with their greatest depth subequal to their greatest dorsal length; cephalic margin of lobes nearly straight, very faintly sinuate; ventro-cephalic angle sub-rectangulate; ventral margin arcuato-truncate oblique emarginate cephalad, median angle broad obtuse, caudal section of same margin subtruncate, obtusely ascending; ventro-caudal angle rounded obtuse; caudal margin faintly oblique, truncate. Tegmina surpassing the caudal femoral apices by about the length of the pronotum, rather narrow, the greatest width contained five and one-half times in the greatest length: costal margin with a low but elongate proximal lobation, thence straight to the distal two-fifths, where the margin is gently arcuate to the apex, which is costal in position; apical margin oblique truncate; sutural margin faintly sinuate: venation rather closely placed; intercalary vein present but irregular. Wings rather narrow, their greatest width contained about two and one-fifth times in the greatest length of the same: anterior field narrow, the margin not deeply angulate-emarginate at the junction of the anterior and axillary fields, the latter with the margin moderately arcuate: discoidal vein with three rami, the proximal of which we consider the median vein, this bifurcate. Prosternal spine broad, low, short conical, the tip slightly antrorse in trend: interspace between the mesosternal lobes subquadrate, weakly enlarging caudad; interspace between the metasternal lobes weakly transverse, narrowing caudad. Ovipositor jaws compressed, moderately elongate, apices somewhat blunted, dorso-lateral margins irregularly crenulate. Cephalic and median limbs short. Caudal femora moderately slender, greatest depth contained about four and one-half times in the greatest length of the same; caudal tibiae distinctly shorter than the femora, pilose, dorso-external margin armed with five spines, dorso-internal margin with seven spines: caudal tarsi elongate, slender, second joint nearly as long as the metatarsus, third joint but little short of the combined length of the metatarsus and second joint; arolia large.

Allotype.—♂; Same data as the type.

Differing from the description of the type in the features here mentioned. Size relatively small. Head faintly wider than the cephalic section of the pronotum: interocular space very narrow, no wider than the second antennal

segment: eyes prominent, their greatest depth more than twice that of the infra-ocular portion of the genae: antennae about three times as long as the dorsum of the pronotum. Pronotum with the lateral lobes faintly deeper in proportion to their length. Tegmina with the greatest width contained nearly six times in their greatest length. Interspace between the mesosternal lobes sublongitudinal, distinctly broadening caudad; interspace between the metasternal lobes strongly longitudinal and very narrow. Supra-anal plate large, scutellate, proximal half with the lateral margins subparallel, distal half with the margins sinuato-convergent, making the distal portion sub-rectangulate in form; an elevated double sigmoid carina crosses the plate at the proximal two-fifths, proximad of which the plate is subtectate in section, with the crest of the tectation expanded and subsulcate in the distal two-fifths of the plate: cerci elongate, reaching to the apex of the supra-anal plate, simple, tapering, acuminate, regularly inbowed: subgenital plate with the margin slightly elevated and appreciably compressed disto-dorsad. Caudal tibiae with six to eight spines on the dorso-external margin.

General color deep blue black, overlaid on the cicatricose and strumose elevations with marmorations of light cadmium to dull ochraceous-orange. Eyes amber brown (σ^7) to bay (φ); antennae of the general color, narrowly lined laterad on the proximal third with pyrite yellow. Tegmina with the general color more olivaceous black, the venation completely outlined in olive-ocher. Wings weakly washed with fuscous, more thickly so distad and along the periphery, heavily so along the distal two-thirds of the costa; longitudinal veins strongly pencilled with fuscous; proximal portion of the disk washed with jasper red. Abdomen dorsad and laterad garnet brown (σ^7) to nopal red (φ), the segments more (φ) or less (σ^7) strongly, broadly and completely banded proximad with black; venter of the abdomen similarly patterned but with the reddish replaced by sanford's brown; apex of the abdomen largely black, ovipositor jaws dull orange. Cephalic and median limbs of the general color, lined on the dorsal and ventral surfaces and at the extremities of the articles with dull orange. Caudal femora of the general color, the dorsal carinae, a broad bar along the ventro-external carina and the genicular lobes dull orange: caudal tibiae of the general color, weakly lined along the dorso-lateral angles with dull buffy; caudal tarsi lined on the external face with dull pale buffy.

Measurements (in millimeters)

	σ^7 (allotype)	φ (type)
Length of body,	21.8	33.2
Length of pronotum,	4.8	6.9
Greatest (caudal) width of dorsum of pronotum,	3.6	5.2
Length of tegmen,	20.5	28
Greatest width of tegmen,	3.8	5.2
Length of caudal femur,	13.4	17.5

The type and allotype are all we have seen of this striking species.

Abila smaragdipes (Bruner)

1911. *Abila smaragdipes* Bruner, Ann. Carneg. Mus., viii, p. 96. [Pará and Santarem, Brazil.]

Pará, Pará. (C. F. Baker.) One female.

This specimen fully agrees with Bruner's description. In the presence of a continuous, distinctly sulcate, frontal costa this form seems to us to approach the related genus *Aristia*, but at present we are not in a position to make any more definite statement of the exact position the species should hold. It is, however, certainly not a typical *Abila*.

Abraçris obliqua (Thunberg)

1824. *Gr[yllus] obliquus* Thunberg, Mém. Acad. Imp. Sci. St. Pétersb., ix, p. 414. [Brazil.]

1860. *Acridium consors* Stål, Kongl. Svenska Fregatt. Eugen. Resa, Zool., Insecta, p. 327. [Rio de Janeiro, Brazil.]

1906. *Omalotettix signatipes* Bruner, Proc. U. S. Nat. Mus., xxx, p. 673. [Sapucay, Paraguay (types); Pernambuco, Brazil; Temax, Yucatan.]

Ceará, Ceará. (W. M. Mann.) One male, two females.

Baturite Mountains, Ceará. (W. M. Mann.) One female.

Maranguape Mountains, Ceará. (W. M. Mann.) Four males, two females.

Baixa Verde, Rio Grande do Norte. (W. M. Mann.) One female.

Natal, Rio Grande do Norte. (W. M. Mann.) Three males.

Independencia, Parahyba. (Mann and Heath.) Three males, three females.

We have made a careful study of the species of this genus, having material of all except the quite different *conspersipennis* before us, and find that Thunberg's *obliquus* is clearly the oldest name for this species. For years placed in the genus *Osmilia* and recorded a number of times under that generic name, there is no question but that Thunberg had a member of this genus before him. The original description is brief, but with Stål's later comments from the typical material, and his synonymy of his *consors* with Thunberg's species⁵⁴ the above synonymy of *signatipes* is clear.

Through the kindness of Prof. Bruner we have before us a female paratype of *signatipes*, which is inseparable from the females from the Maranguape Mountains. We have recorded

⁵⁴ Recen. Orthopt., i, p. 69, (1873).

material as *signatipes* a number of times, but, in the light of the series now before us, we find that our references were correct in but a portion of one lot, i. e. the Bonito, State of Pernambuco and Espirito Santo, Brazil, representatives.⁵⁵ The other references by us of material as *signatipes* all should be placed under *chapadensis* and *caeruleipennis*.⁵⁶ The specimen supposed to be from St. Thomas, West Indies,⁵⁷ we feel is erroneously labelled, being *obliqua* probably from the State of Pernambuco, Brazil.

The specimens before us have strongly decided coloration contrast; in the case of certain of the specimens this is due to alcoholic immersion, but not in all. The size is uniformly small, as said by Thunberg similar to that of "*Gryllus apricarius*" (= *Stauroderus apricarius*). The lateral markings of the caudal femora are strongly indicated in all, while the externo-ventral face always shows some black, but this may be broken up into two areas (aside from the genicular infuscation) by a pale area.

Abracris dilecta Walker

1870. *Abracris dilecta* Walker, Catal. Dermapt. Salt. Brit. Mus., iv, p. 642. [Santarem, Brazil.]

1908. *Omalotettix meridionalis* Bruner, Biol. Cent.-Amer., Orth., ii, pp. 280, 281. [Demerara, British Guiana; Chapada, Brazil.]

Pará, Pará. (W. M. Mann.) One male. (C. F. Baker.)
One male.

After careful study of the original descriptions, the present material and a cotypic pair of *meridionalis* from Demerara, loaned by Prof. Bruner, we feel the above synonymy to be correct. Kirby considered *dilecta* to be the same as *signatipes* (= *obliqua*), but its original dimensions appear to be too large for that form, to which, however, the present species is very closely related.

The range of the species extends from British Guiana south to Victoria, State of Espirito, Brazil and Santa Cruz de la Sierra, Bolivia.

⁵⁵ Proc. U. S. Nat. Mus., xxxvi, p. 149, (1909).

⁵⁶ Proc. Acad. Nat. Sci. Phila., 1907, p. 185, (1907); [*chapadensis* and *caeruleipennis*]: Ibid., 1908, p. 17, (1908); [*caeruleipennis*]: Proc. U. S. Nat. Mus., xxxvi, p. 149, (1909); [Chapada material—*caeruleipennis*]: Proc. Acad. Nat. Sci. Phila., 1913, p. 339, (1913); [*caeruleipennis*]: Ibid., 1915, p. 285, (1915); [*caeruleipennis*].

⁵⁷ Proc. U. S. Nat. Mus., xxxvi, p. 149, (1909).

Abracris caeruleipennis (Bruner)

1900. *Jodacris* (?) *caeruleipennis* Bruner, Second Rep. Merchants Loc. Invest. Comm. Buenos Aires, p. 68. [Asuncion, Paraguay; Territory of Formosa, Argentina.]

Natal, Rio Grande do Norte. (W. M. Mann.) One female.

Independencia, Parahyba. (Mann and Heath.) One male.

In a forthcoming paper we intend to make some detailed comments on this species, its relationship and distribution.

Osmilia flavo-lineata (DeGeer)

1773. *Acrydium flavo-lineatum* DeGeer, Mém. Hist. Ins., iii, p. 497, pl. 42, fig. 4. [Surinam.]

Porto Velho, Rio Madeira. (Mann and Baker.) Two males.

Manaos, Amazonas. (Mann and Baker.) One female.

Pará, Pará. (W. M. Mann.) Two females.

Peixe Boi, east of Pará, Pará. November to December, 1907. (H. B. Merrill.) Two males, one female.

Maranguapé Mountains, Ceará. (W. M. Mann.) One female.

Independencia, Parahyba. (Mann and Heath.) Two females.

Aside from the Peixe Boi representation, all of these specimens have been immersed in alcohol and in consequence have lost much of their original color tones. The disk of the wing is either distinctly, or shows traces of being washed with yellowish in the specimens which have been in liquid preservative, while the Peixe Boi male has a pale bluish and the female a glaucous tint to the same area. One of the Pará females has a yellowish wing coloration, which apparently has had a minimum of alteration, and it is very similar in this respect to British Guianan material.

There has been so much confusion regarding the relationship of the very closely allied forms of this genus, that a good portion of the distributional data published in the past has little value on account of the strong probability of erroneous determinations. We feel that this genus is very closely related to *Abracris*, and should not be placed in the isolated position generally assigned to it.

The present species appears to range from Colombia to eastern Brazil, to the upper Amazonian region.

Locheuma brunneri (Scudder)

1875. *Elaeochlora brunneri* Scudder, Proc. Boston Soc. Nat. Hist., xvii, p. 270. [Eastern slope of the Peruvian Andes.]

1889. *Vilerna flavipennis* Gerstaecker, Mitth. Naturw. Ver. Neu-Vorpomm. Rügen, Greifswald, xx, p. 13. [Fonteboa, Amazonas, Brazil.]

Pará, Pará. (C. F. Baker.) One male, one female.

Peixe Boi, east of Pará, Pará. November to December, 1907. (H. B. Merrill.) Four females.

Igarapé-Assu, Pará. January 17, 1912. (H. S. Parish.) One male. [A. N. S. P.]

This material fully agrees with Scudder's type, which is now before us, and with Gerstaecker's description of *flavipennis*, also with two males and one female of the species from eastern Peru (Rio Pacaya, July to September, 1912, two males; Almeria, January 17 to 18, 1913, one female).

For a proper understanding of the unfortunate complications the proper placing of Scudder's name necessitates, it will be necessary to discuss the matter chronologically. Scudder's original assignment of the species to the genus *Elaeochlora* was, of course, incorrect, the latter genus having never been seen by him. He was also in error in stating the unique type to be a male, as it is of the opposite sex. The type has been dried from alcohol and has lost almost all of the original coloration. It is labelled in Scudder's handwriting, "*Elaeochlora Brunneri* Scudd. type. Peruv. Andes." In his original description of *flavipennis* Gerstaecker suggests that Scudder's name may have been based on the other sex of his species, which was based on the female; as a matter of fact *brunneri* was based on a slightly smaller individual of the same sex of the same species as his *flavipennis*. In 1890, Scudder⁵⁸ decided that *brunneri* represented a new genus allied to *Catreus*, which he named *Locheuma*. As a genus it is close to *Vilerna* Stål, and provisionally, at least until we know more about the relationship of the two entities, can be considered of generic rank, but it is in no way related to *Catreus*. In 1898, Giglio-Tos⁵⁹ erected the genus *Caletodes* on two species, one of which, *C. alatus*, has been selected as the type. His genus *Caletodes* is identical with *Locheuma* and must fall for the older name, while we feel little doubt but that the species

⁵⁸ Proc. Bost. Soc. Nat. Hist., xxvii, p. 207, (1890).

⁵⁹ Bollett. Mus. Zool. Anat. Comp. Torino, xiii, no. 311 p 59

alatus from eastern Ecuador is identical with *brunneri*. There is little in the way of characters on which the genus *Locheuma* (*Caletodes*) can be retained as distinct from *Vilerna*, as the supposedly diagnostic feature, the form of the caudal margin of the pronotal disk, is found to be individually variable in *Vilerna aeneo-oculata* and *rugulosa*, while the general pronotal form is approximated in the latter species. For the present, however, we prefer to consider *Locheuma* a distinct genus, the species *festae* of Giglio-Tos, which unfortunately was not selected as the genotype, having a very different appearance. Further study may bring out some more salient features to clearly distinguish *Vilerna* and *Locheuma*.

Our *Caletodes pulchripes*, from Balzapamba, Ecuador,⁶⁰ is quite close to *brunneri* and when more material is examined may prove to be the same, or, if *alatus* is distinct, the same as that species. However, *pulchripes* differs from the material of *brunneri* in being much more rugose, in having a shorter pronotum and a transverse mesosternal interspace. The characters previously supposed to be diagnostic of *pulchripes* are apparently only individual. The present species, like others of the *Vilernae*, is a variable one in minor features and this variation appears to be largely individual. Bruner has recorded this species (as *flavipennis*) from Pará and Chapada, Matto Grosso, Brazil.

Nuciera elegantula new species (Plate XV, fig. 42.)

This species is placed in this genus provisionally, as it shows certain differences from the relatively poor generic description of *Nuciera* (*Nuceria* Stål nec Walker), which may prove to be of generic importance. Of the known genera of the *Vilernae*, *elegantula* appears to show greater affinity with *Nuciera*, and we prefer to place it here until more is known concerning the genotype and only previously known species—*N. roseipennis* Stål. The fastigium is broader in the present insect than the description would lead one to suppose was the case in *roseipennis*, while the supplementary facial carinae are subparallel and not more divergent than in *Vilerna*, as described.

When compared with the description of *roseipennis* the present insect can be readily distinguished by its much smaller size, smoother face, blunter and more rounded vertex, in the tegmina

⁶⁰ Proc. Acad. Nat. Sci. Phila., 1913, p. 99, figs. 13 to 15, (1913).

falling considerably short of the apices of the caudal femora, in the prosternal spine being short and blunt conical, the caudal tibiae armed on the dorso-external margin with six to seven spines, in the antennae each having two pale annuli and the lateral lobes of the pronotum not marked with yellowish, although the face is.

Type.—♀; Peixe Boi, east of Pará, State of Pará, Brazil. November to December, 1907. (H. B. Merrill.) [Acad. Nat. Sci. Phila., Type no. 5314.]

Size small: form moderately slender, subcompressed: surface of head and limbs smooth but minutely shagreenous, of pronotum and pleura more or less cribroso-punctate, of venter and abdomen moderately polished. Head with the exposed dorsal length subequal to that of the prozona: occiput distinctly ascending, then declivent to the interocular space, which is hardly wider than the proximal antennal joint, and the whole dorsum of the head, from the cephalic margin of the fastigium, with a fine continuous medio-longitudinal sulcus; fastigium broad, but faintly longer than wide, the margin regularly arcuate, faintly subparallel caudad, slightly flattened meso-cephalad, the margin distinctly cingulate: fastigio-facial angle rounded rectangulate when seen from the side, the interantennal protuberance rotundato-truncate for a short distance, then passing into the regularly retreating and moderately concave facial line; frontal costa dorsad distinctly broader than the proximal antennal joint, immediately dorsad plane but biseriate punctate, ventrad of this the costa is deeply and sharply sulcate to the clypeus, the borders of the costa moderately constricted ventrad of the ocellus at the usual transverse facial sulci, thence distinctly diverging: lateral facial carinae slightly sinuate, subparallel: eyes very prominent, globose when seen from the dorsal surface, in basal outline broad ovate, their greatest depth nearly twice that of the infra-ocular portion of the genae: antennae slightly longer than the dorsal length of the head and pronotum, slightly and very gradually enlarging distad, the joints moniliform and from the third regularly increasing in length distad. Pronotum with the greatest dorsal (caudal) width contained one and one-half times in the greatest length of the same, when seen from the side the dorsal line is moderately impressed at the principal transverse sulcus, faintly so at the cephalic transverse sulcus; cribroso-punctuation of pronotum strongest on the metazona and along the cephalic and ventral margins, weakest on the disk of the prozona of the lateral lobes; cephalic margin of disk arcuate, weakly flattened mesad, caudal margin obtuse-angulate, lateral angles of disk broadly rounded except for a weak shoulder on the metazona; median carina weak but continuous, subobsolete mesad, transverse sulci well impressed, the caudal one severing the median carina at the caudal third: lateral lobes with the greatest depth contained one and one-third times in the greatest dorsal length of the same; cephalic margin of lobes obliquely sinuate, ventro-cephalic angle obtuse, ventral margin arcuato-emarginate cephalad, gently arcuate caudad, ventro-caudal angle rounded, obtuse, caudal margin weakly oblique, truncate. Tegmina abbreviate, about one and one-half times as long as the

head and pronotum together, falling short of the femoral apices by about the length of the pronotum; form elongate lanceolate, the greatest width contained four and one-half times in the length of the same; costal margin faintly arcuate, apex rather narrowed, rounded, sutural margin gently arcuate, faintly sinuate near the apex: venation distinct, rather sparse. Wings short, broad, the distal extremity subtruncate; anterior field very narrow. Prosternal process very low, blunt conical, faintly retrorse at the apex: interspace between the mesosternal lobes strongly transverse, the lobes broadly oblique arcuate; interspace between the metasternal lobes wedge-shaped, the lobes strongly converging caudad. Ovipositor jaws strongly compressed, the tips moderately recurved, the dorso-lateral margins regularly and strongly serrato-dentate. Cephalic and median limbs relatively short. Caudal femora nearly two and a half times as long as the pronotum, moderately robust, the greatest depth contained four times in the greatest length, pregeniculate region slender; dorsal carina very minutely serrulate;⁶¹ pattern of the paginae regular, well spaced; geniculate lobes bluntly acute: caudal tibiae distinctly shorter than the femora, faintly sinuate; dorso-external margins armed with six to seven spines, dorso-internal margins with eight spines: caudal tarsi with the third joint faintly longer than the first and second united; arolia rather small, compressed.

General color ecru-olive, paling to isabella color on the tegmina and darkening to buffy olive on the dorsum of the abdomen, ventral surface heavily washed with fuscous. Head with the genae and face ventrad of the ocellus mustard yellow, the fastigium and adjacent portion of the frontal costa margined with the same, the dorsum of the head and the postocular region blotched with dusky olive-green; eyes deep russet; antennae blackish, lineato-annulate proximad on the dorsal surface, and completely biannulate with antimony yellow distad. Pronotum mottled dorsad and laterad with dusky olive-green; pleura more clearly of the base color. Tegmina with three large blotches and numerous points of dark olive. Wings weakly infusate, proximad faintly glaucous. Cephalic and median limbs of the general color annulate with dusky olive-green. Caudal femora on the dorsal and lateral surfaces much blotched with dusky olive-green, the carinae more or less regularly beaded with the same; ventral sulcus washed with russian green; scattered over the carinae and paginae of the caudal femora are numerous rounded areas of the general color, outlined by a dark annulus and containing a smaller dark annulus;⁶² caudal tibiae cinnamon brown proximad passing into blackish distad, the spines of the same tone, both the dorsal and ventral carinae of the tibiae bear proximad some annular areas similar to those on the femora; dorso lateral, but particularly dorso-external, margins strongly ciliated: caudal tarsi blackish with some ecru olive.

Length of body, 20.4 mm.; length of pronotum, 4.5; greatest (caudal) width of pronotal disk, 2.7; length of tegmen, 10.5; length of caudal femur, 12.

The type of this remarkable species is unique.

⁶¹ As seen at certain angles this would be called smooth.

⁶² It is possible these areas may be analogous to the tubercles described by Bruner as occurring in the same region in the peculiar but allied *Aptoceras margaritatus* (Biol. Cent.-Amer., Orth., ii, p. 286, (1908)).

Sitalces madeirensis new species (Plate XV, fig. 41.)

A very peculiar species, which can be immediately recognized from the others of the genus by the completely developed tegmina and wings.

Type.—♀; Porto Velho, Rio Madeira, Brazil. (Stanford Expedition; Mann and Baker.) [Acad. Nat. Sci. Phila., Type no. 5289.]

Size small: surface smooth, except for the regularly punctate metazona of the pronotum and irregularly rugoso-punctate remaining section of the lateral lobes and faintly punctate pleura. Head with the dorsal line moderately declivent from the rounded occiput to the apex of the fastigium; vertex with the interspace between the eyes very narrow, not more than one-half that of the interocular portion of the frontal costa, very narrowly sulcate; fastigium slightly transverse, trigonal, apex narrowly arcuato-truncate, surface strongly excavate mesad; fastigio-facial angle obtuse, the interantennal region vertical, truncate when seen from the lateral aspect, facial line ventrad of the angle moderately retreating: frontal costa at fastigio-facial angle moderately wider than the interocular space of the vertex, between the antennae expanding to twice as wide as the ocular interspace then narrowing to the dorsal width, thence ventrad subequal in width until it become subobsolete immediately dorsad of the clypeal suture, interocular space plane, biseriate punctate, sulcate for about two-thirds of its length ventrad of the ocellus; supplementary facial carinae decided, moderately and regularly diverging ventrad, a narrow area ventro-cephalad of eye and involving the supplementary carinae callose; eyes moderately prominent, broad-ovate in basal outline, about one and one-third times as long as the infra-ocular portion of the genae; antennae filiform, short, about twice as long as the pronotum. Pronotum sellate, slightly but appreciably narrowed mesad, the dorsal line appreciably concave, cephalic section subequal in width to the inserted portion of the head; disk with the greatest caudal width contained one and one-fifth times in the greatest length of the same: cephalic margin of the disk considerably produced, bisarcuate, the median dividing emargination very broad and relatively shallow; caudal margin of disk arcuato-truncate with a decided broad V-shaped median emargination; median carina broad but low, continuous but decidedly severed by all the transverse sulci except the cephalic one; transverse sulci broad, pronounced, decidedly impressed, the cephalic one weaker, the second sulcus not continuous over the lateral lobes as is the case with the others, metazona comprising one-third of the dorsal length of the pronotum: lateral lobes with the greatest depth equal to two-thirds of the greatest dorsal length of the same, cephalic margin of lobes oblique, faintly sigmoid, ventro-cephalic angle sub-rectangulate, ventral margin quadrantiform-emarginate, median angle rounded sub-rectangulate, caudal section of ventral margin sinuato-truncate, weakly ascending dorso-caudad, ventro-caudal angle rounded sub-rectangulate. Tegmina surpassing the tips of the caudal femora by nearly the pronotal length, sublanceolate: costal margin with shallow, very elongate proximal lobe, distal portion of the same margin rather strongly arcuate to the narrowly rounded apex, which is nearer the sutural margin: venation rather sparse, somewhat

irregular, interspaces of distal section irregular in size and shape; texture coriaceous. Wings subhyaline, reaching to the tegminal apices, rather narrow. Prosternal process a broad, low swelling bearing on its apex a short, sharp, cephalad recurved tooth: interspace between the mesosternal lobes subquadrate, in width slightly less than one of the lobes, internal margins of lobes subparallel, appreciably arcuate, caudal angles well rounded: mesosternal lobes narrowly separated caudad. Supra-anal plate elongate, sublanceolate, in transverse section arcuate, lateral margins gently arcuate, convergent to the narrowly rounded apex, proximal half of the plate with distinct lateral inter-marginal low carinae, a distinct medio-longitudinal, elongate-elliptical sulciform impression and a faint transverse division separating the proximal from the distal section of the plate: ovipositor valves elongate, considerably compressed, the tips of both sets of valves strongly hooked, the external margins of the dorsal valves crenulato-dentate. Cephalic and median limbs quite slender. Caudal femora of average build, not markedly slender, subcompressed, in length equal to two-thirds that of the tegmina, greatest depth contained three and one-third times in its greatest length; dorsal carina very faintly serrulate, regularly supplied with long hairs, dorso-external and ventro-external carinae simple, pattern of the paginae regular, open, dorso-genicular margin with a faint median tooth; genicular lobes with their apices faintly acute, ventral margin of the lobes sigmoid, deepest proximad: caudal tibiae slightly shorter than the femora, faintly sigmoid in outline, slender, armed on the external margin with six spines, on the internal margin with nine spines: caudal tarsi with the proximal joint about twice as long as the second joint; third joint subequal to the first and second joint together.

General color (specimen dried from liquid preservative) olive-yellow, a pair of broad lateral bars of fuscous black extending from caudad of the eyes, over dorsal two-thirds of the lateral lobes of the pronotum, dorsal section of the pleura, metanotum, dorsum of the three proximal abdominal segments and over the tegmina, becoming fuscous on the latter. Head with the dorsal section of the antennal grooves, occiput, vertex and on the fastigium weakly fuscous black, regular disposed series of dots of the general color in diverging lines extending from the fastigium around the eyes, a line of callose areas margining the eyes ventro-cephalad and the postocular bar ventrad, these strikingly cream-buff; eyes mars brown clouded with fuscous; antennae of the general color. Pronotum with the median and the position of the lateral carinae distinctly of the general color, the base tone of the dorsum more ecru-olive, the pale lateral dorsal lines contrasted mesad by a wash of fuscous; lateral lobes with the greater portion of the pale ventral section callose and cream-buff in color. Pleura with the callose cream-buff line represented by two oblique dashes, one dorso-cephalad of the insertion of each limb. Tegmina with the region of the anal vein narrowly marked with the general color. Wings washed with fuscous, longitudinal veins strongly lined with fuscous-black, transverse veins paler. Caudal femora with the genicular region and proximal extremity of the tibiae washed with ferruginous, the genicular lobes with several fuscous spots, tibial spines black tipped.

Length of body, 15 mm.; length of pronotum, 3; greatest (caudal) width of pronotal disk, 2.7; length of tegmen, 13.4; length of caudal femur, 8.7.

The type of this remarkable species is unique. It may require generic separation when more is known of the other species of *Sitalces*, but its affinity is most certainly with that genus.

Cocama tripunctata new species

Allied to *C. trivittata* Giglio-Tos, the type of the genus, having the general form similar, the proportions in the same ratio and the lateral lobes of the pronotum with pale callose areas, but differing in the striping being reduced to a blackish postocular line continued over the pronotum to the apices of the tegmina, in the lateral lobes having two instead of one yellow callose area and in a similar one being placed on the metapleura, in the frontal costa being broader at its junction with the fastigium, in the deep red of the greater portion of the caudal femora and in the green caudal tibiae and distal extremity of the femora.

Type.—♀; Pará, State of Pará, Brazil. (C. F. Baker.) [Acad. Nat. Sci. Phila., Type no. 5290.]

Size medium; form robust, subfusiform; surface of head, pronotum and pleura more or less rugulose, of abdomen, venter and caudal limbs smooth or sparsely punctate. Head with the exposed dorsal surface equal to about two-thirds the length of the dorsum of the pronotum: occiput arcuate inflated, moderately elevated dorsad of the pronotal disk, regularly arcuate declivent to the fastigium; interocular portion of the vertex narrow, no wider than the proximal section of the second antennal joint, faintly sulcate: fastigium subhorizontal, faintly declivent, moderately produced, trigonal in outline, as broad as long, very faintly impressed within its margins, very weakly and shallowly broad sulcate; fastigio-facial angle rounded when seen from the side, the cephalic section of the interantennal protuberance arcuato-truncate and ventrad regularly arcuate into the decidedly retreating and concave facial line; frontal costa between the antennae no wider than the proximal antennal joint, subequal in width, plane and sparse punctate, except immediately dorsad of ocellus where it is irregularly sulcate, briefly constricted ventrad of the ocellus and indicated to the clypeal suture, but the margins, which are subcarinate, are irregular and broken, this section irregular sulcate; genae with some irregular, low, strumose ridges and points: eyes prominent, moderately exserted when seen from the dorsum, hardly elevated above the dorsal line of the head when seen from the side, in basal outline elliptico-ovate, slightly flattened, in depth nearly half again that of the infra-ocular portion of the genae: antennae as long as the head and pronotum together, rather heavy, subdepressed. Pronotum subcylindrical, moderately enlarging caudad on the metazona, prozona subequal in width, weakly sellate when seen from the side, surface of prozona coarsely rugose impresso-punctate, on metazona closely and finely cribroso-punctate; cephalic width of pronotum no narrower than the caudal section of the head: cephalic margin of pronotal disk weakly arcuate with a very faint median sinuation, caudal margin of disk very broadly and bluntly obtuse-angulate, faintly

sinuate laterad of the rounded angle; median carina subobsolete, well indicated at cephalic margin; no lateral carinae, the disk broadly rounding into the lateral lobes; transverse sulci well marked, the caudal one deeply impressed, metazona one-half as long as the prozona: lateral lobes with the dorsal length slightly greater than the maximum depth of the same; cephalic margin moderately oblique, faintly sigmoid: ventro-cephalic angle rotundato-rectangulate; ventral margin with cephalic half strongly arcuato-emarginate, declivent cephalad, nearly straight; ventro-caudal angle obtusely rounded; caudal margin of lobes nearly vertical, straight; surface of lateral lobes bearing on ventral half two callose areas, one semi-elliptical and cephalad of the other, which is roughly circular. Tegmina slightly more than twice as long as the disk of the pronotum, acuminate, the venation finely and regularly patterned, the anal area appearing cribroso-punctate: costal margin with a distinct but not very high lobe at distal third, thence distad the same margin is straight, the tegmen narrowing to the narrowly rounded apex. Wings reaching to the extremities of the tegmina. Prosternal spine erect, acute, faintly recurved cephalad at the apex: interspace between the mesosternal lobes very faintly transverse, slightly narrower than one of the lobes: metasternal lobes subattingent caudad: metapleura with a nearly circular callose area proximad, similar in character to those on the lateral lobes. Abdomen moderately compressed, carinate dorsad: supra-anal plate slightly elongate trigonal, carinate and tectate distad, with a distinct medio-longitudinal impressed area proximad: cerci short, conical: ovipositor jaws slightly compressed, dorso-external margins of the dorsal valves crenulate, apices moderately curved. Cephalic and median limbs rather short. Caudal femora in length subequal to that of the pronotum and tegmina together, surpassing the apex of the abdomen by less than the length (cephalo-caudad) of the head, in form moderately robust, the greatest depth contained about three and one-half times in the greatest length of the same; dorsal carina rather finely serrulate, the distal extremity of the same with a small blunt tooth, external paginae regularly sculptured, apex of genicular lobes rounded acute-angulate: caudal tibiae slightly shorter than the femora, appreciably expanded distad, the lateral margins crenulato-carinate, most apparent distad, dorso-external margin armed with seven spines, the dorso-internal one with eight spines: caudal metatarsi slightly shorter than the third joint, second joint about five-eighths the length of the metatarsus.

General dorsal color ecru-olive, this being limited laterad by a pair of distinct but not wide fuscous lines, which extend from the dorso-caudal portion of the eyes across the pronotum, in the usual position of lateral carinae, and margining on the sutural side the humeral trunk of the tegmina to the apex. The head has the remainder of its surface ecru-olive to light yellowish olive, with the strumose points more olive-ocher. Pronotum and pleura, meso and metasternum and caudal femora garnet brown, the callose areas on the lateral lobes and pleura bright lemon yellow. Abdomen washed proximad with garnet brown, bronze brown distad, the ovipositor jaws sulphine yellow edged with blackish. Eyes olive-citrine with traces of fuscous; antennae dark russian green proximad, becoming blackish mesad and distad. Tegmina with marginal field bister, costal margin from the lobe distad broadly edged with fuscous. Caudal femora with genicular extremity dark russian green, the arches washed

with blackish and the lobes largely dark dull yellow-green: caudal tibiae dark dull yellow-green, the proximal portion washed with dark russian green; the spines black tipped: caudal tarsi dark dull yellow-green dorsad.

Length of body, 21 mm.; length of pronotum, 4.2; greatest (caudal) width of pronotal disk, 3.4; length of tegmen, 9.7; length of caudal femur, 13.

The type of this most striking species is unique.

Schistocerca desiliens Scudder

1899. *Schistocerca desiliens* Scudder, Proc. Amer. Acad. Arts and Sciences, xxxiv, pp. 443, 455. [Rio de Janeiro and Victoria, Brazil.]

Independencia, Parahyba. (Mann and Heath.) Three females.

This species is now known to range from Santarem and Pará, State of Pará, east to Independencia and Pernambuco, south to Rio de Janeiro, Brazil, and Asuncion, Paraguay, west to Chapadã, State of Matto Grosso, Brazil.

Schistocerca flavofasciata (DeGeer)

1773. *Acrydium flavo-fasciatum* DeGeer, Mém. Hist. Ins., iii, p. 489, pl. 40, fig. 8. [Surinam.]

1899. *Schistocerca aequalis* Scudder, Proc. Amer. Acad. Arts and Sciences, xxxiv, pp. 444, 458. [Demerara.]

Manaos, Amazonas. March, 1908. (H. B. Merrill.) One female. [Acad. Nat. Sci. Phila.]

Igarapé-Assu, Pará. (H. S. Parish.) One male. [Acad. Nat. Sci. Phila.]

As intimated by us some years ago,⁶³ the acquisition of Surinam material enables us to definitely associate Scudder's *aequalis* with the true *flavofasciata* (DeGeer). A female from Paramaribo, Surinam (K. Mayo; A. N. S. P.) fully agrees with DeGeer's description and figure, possessing the very broad pale costal border of the proximal section of the tegmina which is indicated in the original description. Scudder undoubtedly followed Stål's error in considering *flavofasciata* a purely Brazilian species, as Surinam is clearly given as the locality by DeGeer. In consequence Scudder naturally indicated the more strikingly, although narrowly, flavo-fasciate *fimbriata*⁶⁴ as DeGeer's species. Stål states that DeGeer's type was missing from the series before him. The unique type of Scudder's *aequalis* is now before us and it is identical with the Surinam specimen and other material now in our hands.

⁶³ Proc. U. S. Nat. Mus., xxxvi, p. 157 footnote, (1909).

⁶⁴ The present author will shortly discuss this name in detail elsewhere.

In coloration this species varies as much as all the others of this and the related *vaga-zapoteca* complexes of the genus. In addition there is a considerable degree of variation in the coloration of the proximal section of the marginal field of the tegmina. This may be broadly yellowish, may have this color weak along the costal margin or may have no yellow at all. In no case have we seen the yellow as brilliant, as clear and as strongly contrasted as in *fimbriata* (= *flavofasciata* of Stål and Scudder). Structurally this species differs from *fimbriata* in the distinctly greater width of the proximal portion of the marginal field of the tegmina and the broader cerci, which have their distal margin truncate or emarginate, instead of being of the tapering character of *fimbriata*.

Regarding the relationship of the eastern South American forms of this species complex, it seems that *desiliens* indicates a tendency toward the *vaga-vitticeps-zapoteca* complex, somewhat away from the *flavofasciata-fimbriata-infumata* group. However, this conclusion is based largely on the evidence of the extreme *desiliens* condition as found in material from extreme eastern Brazil, while these tendencies are not so decided in specimens from the Rio de Janeiro region. This statement is made chiefly on the basis of general coloration and not on genital characters, as there *desiliens* holds a peculiar position on account of the more tapering cerci. The importance of this feature is, however, not as great as one would imagine from Scudder's comment on the same; *fimbriata* approaches very close to *desiliens* in cercal form and a sufficient series from localities in southeastern Brazil will probably show the typical forms connected up in this feature. The relationship of *desiliens*, *fimbriata* and *infumata* as geographic races of the same species may be proven when sufficient material is in hand. Returning to the coloration, after due allowance has been made for the recessive and intensive features of the general color pattern, it would seem that the pattern is more truly phylogenetic in certain species of this and numerous related, considerably diversified genera, such as *Melanoplus*, *Dichroplus*, etc., than is usually supposed to be the case. To properly appreciate pattern, its fixed and transitory features in the scale of individual, dimorphic and environmental variation must be understood. When these are fully weighed and given their proper value we will probably find in color pattern clues as

valuable for affinities as those becoming evident in numerous groups of birds, when studied from that point of view.

The range of this species extends from British Guiana south to central Amazonia (Manaos), east to the eastern part of the State of Pará (Igarapé-Assu).

Schistocerca pallens (Thunberg)

1815. *G[ryllus] pallens* Thunberg, Mém. Acad. Imp. Sci. St. Pétersb., v, p. 237. [No locality.]

Peixe Boi, east of Pará, Pará. November to December, 1907. (H. B. Merrill.) One female.

Natal, Rio Grande do Norte. (W. M. Mann.) One male, two females.

These specimens have the tegmina more pantherine maculate than material of this species from the Greater Antilles and Mexico, in this respect resembling individuals from Barbados. The general size is less than in the other material seen.

The range of the species extends from eastern Mexico and the Greater Antilles, south to the Uruguay River and northern Argentina, east to Natal, Brazil, and west in South America to the eastern slopes of the Andes in Peru.

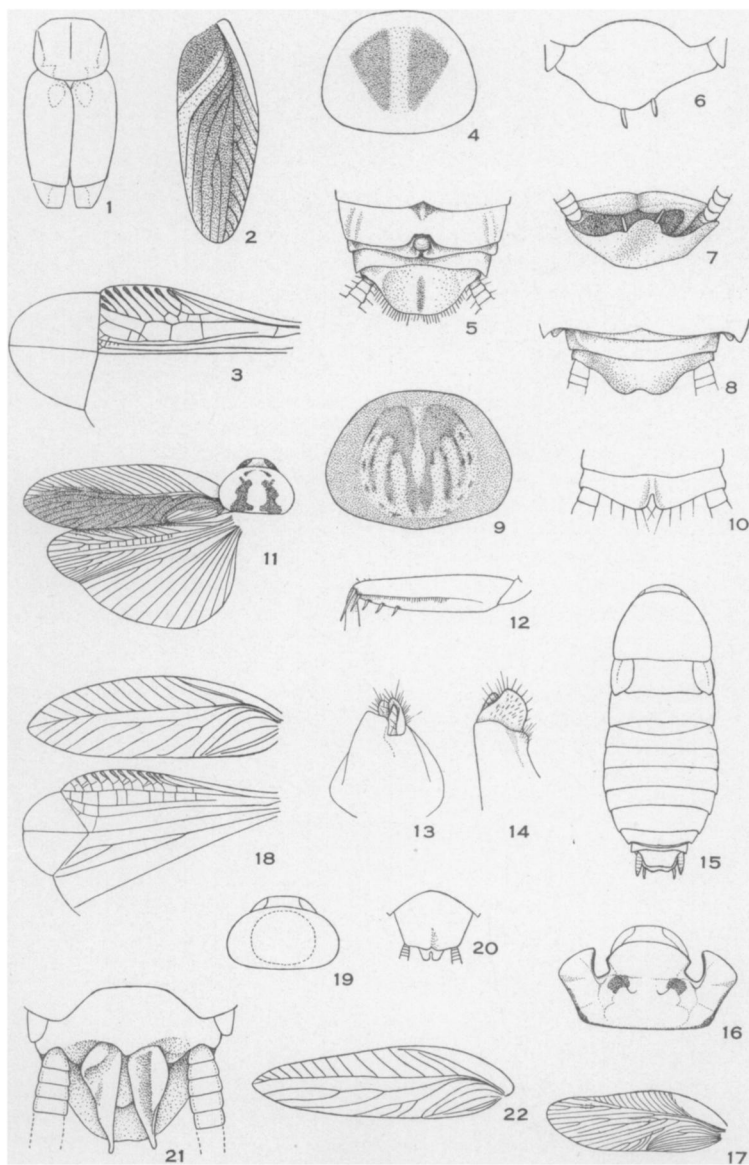
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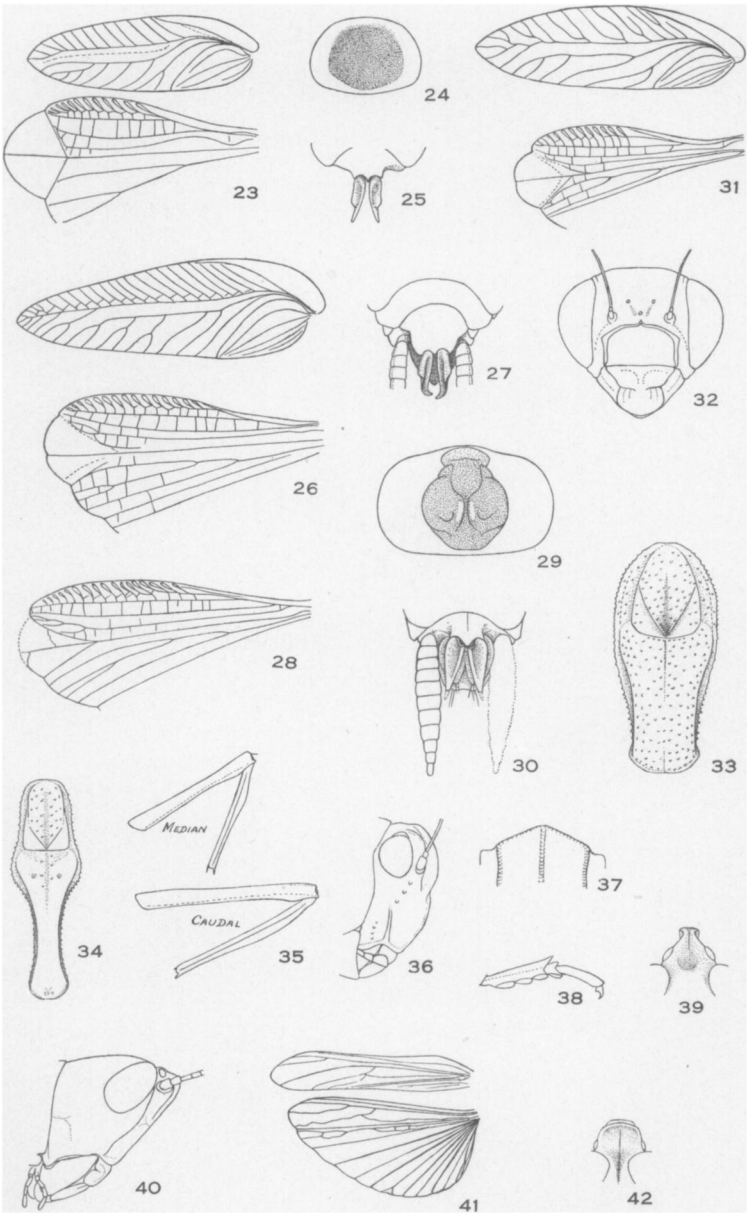
Plate XIV

- Fig. 1.—*Pyragropsis emarginata* new species. Outline of pronotum, tegmina and wings of type, showing color pattern. ($\times 5$)
- Fig. 2.—*Anaplecta analisignata* new species. Venation and pattern of tegmen of type. ($\times 6$)
- Fig. 3.—*Anaplecta analisignata* new species. Anterior field of wing of type. (Greatly enlarged.)
- Fig. 4.—*Ischnoptera amazonica* new species. Pronotal outline and pattern of type. ($\times 6$)
- Fig. 5.—*Ischnoptera amazonica* new species. Dorsal view of apex of abdomen of male (*type*). (Greatly enlarged.)
- Fig. 6.—*Ischnoptera amazonica* new species. Outline of subgenital plate of male (*type*). (Greatly enlarged.)
- Fig. 7.—*Ischnoptera amazonica* new species. Caudal aspect of apex of abdomen of male (*type*). (Greatly enlarged.)
- Fig. 8.—*Ischnoptera amazonica* new species. Supra-anal plate of female (*allotype*). (Greatly enlarged.)
- Fig. 9.—*Caribblatta personata* new species. Pattern of pronotum of type. (Greatly enlarged.)
- Fig. 10.—*Caribblatta personata* new species. Supra-anal plate of type. (Greatly enlarged.)
- Fig. 11.—*Dendroblatta sobrina* new genus and species. Head, pronotum, tegmen and wing of male (*type*). ($\times 2$)
- Fig. 12.—*Dendroblatta sobrina* new genus and species. Ventro-cephalic aspect of cephalic femur of type. (Greatly enlarged.)
- Fig. 13.—*Dendroblatta sobrina* new genus and species. Ventral aspect of subgenital plate of male (*type*). (Greatly enlarged.)
- Fig. 14.—*Dendroblatta sobrina* new genus and species. Dextral aspect of subgenital plate of male (*type*). (Greatly enlarged.)
- Fig. 15.—*Eurycotis manni* new species. Dorsal outline of male (*type*). (Natural size.)
- Fig. 16.—*Schistopeltis peculiaris* new genus and species. Dorsal view of head and pronotum of type. ($\times 2$)
- Fig. 17.—*Schistopeltis peculiaris* new genus and species. Venation of tegmen of type. (Natural size.)
- Fig. 18.—*Chorisonaura polita* new species. Venation of tegmen and portion of wing of female (*type*). ($\times 5$)
- Fig. 19.—*Chorisonaura polita* new species. Outline of dorsum of head and pronotum of female (*type*). ($\times 6$)
- Fig. 20.—*Chorisonaura polita* new species. Subgenital plate of female (*type*). Plate slightly tilted to show more of supra-anal plate. (Greatly enlarged.)
- Fig. 21.—*Chorisonaura albonervosa* new species. Ventral aspect of apex of abdomen of male (*type*). (Greatly enlarged.)
- Fig. 22.—*Chorisonaura albonervosa* new species. Venation of tegmen of male (*type*). ($\times 4$)

Plate XV

- Fig. 23.—*Chorisoneura pulcherrima* new species. Outline of tegmen and portion of wing of female (*type*). ($\times 5$)
- Fig. 24.—*Chorisoneura pulcherrima* new species. Outline and pattern of pronotum of female (*type*). (Greatly enlarged.)
- Fig. 25.—*Chorisoneura pulcherrima* new species. Subgenital plate of female (*type*). (Greatly enlarged.)
- Fig. 26.—*Chorisoneura tessellata* new species. Venation of tegmen and portion of wing of male (*type*). ($\times 4$)
- Fig. 27.—*Chorisoneura tessellata* new species. Ventral aspect of apex of abdomen of male (*type*). (Greatly enlarged.)
- Fig. 28.—*Chorisoneura lata* new species. Outline of portion of wing of male (*type*). ($\times 4$)
- Fig. 29.—*Chorisoneura lata* new species. Outline of pattern of pronotum of male (*type*). ($\times 6$)
- Fig. 30.—*Chorisoneura lata* new species. Ventral aspect of apex of abdomen of male (*type*). (Greatly enlarged.)
- Fig. 31.—*Chorisoneura personata* new species. Venation of tegmen and portion of wing. ($\times 5$)
- Fig. 32.—*Metriomantis planicephala* new species. Cephalic aspect of head of female (*type*). ($\times 3$)
- Fig. 33.—*Metriomantis planicephala* new species. Dorsal aspect of pronotum of female (*type*). ($\times 3$)
- Fig. 34.—*Cardioptera minor* new species. Dorsal aspect of pronotum of female (*type*). ($\times 2$)
- Fig. 35.—*Cardioptera minor* new species. Median and caudal femora and tibiae of female (*type*). ($\times 2$)
- Fig. 36.—*Paurotarsus insolitus* new species. Lateral outline of head of female (*type*). ($\times 5$)
- Fig. 37.—*Paurotarsus insolitus* new species. Cephalic margin of pronotal disk of female (*type*). (Greatly enlarged.)
- Fig. 38.—*Paurotarsus insolitus* new species. Caudal tarsus of female (*type*). (Greatly enlarged.)
- Fig. 39.—*Copiocera prasina* new species. Dorsal view of fastigium of female (*type*). ($\times 5$)
- Fig. 40.—*Copiocera prasina* new species. Lateral outline of head of female (*type*). ($\times 3$)
- Fig. 41.—*Sitalces madeirensis* new species. Outline of tegmen and wing of female (*type*). ($\times 2$)
- Fig. 42.—*Nuciera elegantula* new species. Dorsal outline of fastigium of female (*type*). ($\times 5$)





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